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OPA Establishes Maximum Pulp Prices

New Regulation Effective April 20 Replaces Prices Producers Have Maintained By Voluntary Agreement — Only Groundwood Price Level Effected—Cost Factors and Profit Margins Explained.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., April 20, 1942—Maximum prices at which the various grades of domestic and foreign woodpulp, basic raw material used in the production of paper, can be sold in the United States or for export are established in Maximum Price Regulation No. 114 (Woodpulp), issued April 16 by Price Administrator Leon Henderson. The regulation effective April 20, replaces prices which producers at the OPA's request, have maintained since July 1, 1940.

Supplanting current pricing systems, such as the "on dock Atlantic Seaboard" method, which caused certain price inequities, the regulation establishes a single price system with freight allowances based on geographic location of the producing mill.

With respect to the price level, an increase is effected only in the price of groundwood pulp.

In the case of groundwood pulp, the price is now $46 per delivered ton, which represents an increase of $6 per ton for domestically produced pulp and now conforms with existing price levels on imported groundwood pulp. At present, Canadian imports represent 80% of the total groundwood consumed here.

A factor in the industry that the OPA found might lead to serious inflation in wood pulp prices was an accelerating domestic demand for wood pulp accompanying the loss of Scandinavian imports, which before the war amounted to 27% of the wood pulp used in this country. Another factor was the heavy drain on replacement tonnage by the requirements of the war effort.

"A similar set of circumstances in the wood pulp industry prevailed during the period of 1917 to 1920," Mr. Henderson said. "Prices then, in response to pressure of mounting demands upon receding supplies, reached a high of $270 per ton for bleached sulphite pulp in 1920.

OPA Considers Cost Factors in Prices

"Increases in production costs—such as a rise in the price of pulpwood in some areas, advancing wages, increases in stumpage and transportation costs, repair and maintenance—were weighed by OPA in the light of current profits made by market producers of chemical woodpulps. Profits in the years 1940 and 1941 made by representative producers whose profit and loss statements and cost data have been studied by OPA have been clearly adequate.

"The margin of profit of representative producers in the South generally has been high. In some cases this margin was 48% of net worth in 1940 and even more in 1941. Profit margins on the West Coast are not as great, but are high. In the Lake Central and Northeast areas profits of representative mills has been adequate.

"While the increases in cost previously referred to have been appreciable, it is felt that, at least with respect to the producers of a large majority of the wood pulp made in the United States, these costs can be readily absorbed. Accordingly, the overall prices of chemical grades of wood pulp have not been increased by the regulation."

The single price method used in the new regulation provides the OPA with a more effective base for control of wood pulp prices than was possible under the four existing price methods, and the consumer, regardless of his location, now will be able to purchase each grade of wood pulp at a relatively uniform price.

The regulation uses delivered prices which include varying transportation allowances, dependent upon the area in which producing mills are located. Transportation charges in excess of amounts specified in the regulation must be paid for by the purchaser.

Production Areas

Production areas, listed in the order, are:

NORTHEASTERN, which includes the States of Ohio, Pennsylvania, Delaware, Maryland, New Jersey, New York, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire and Maine.

LAKE CENTRAL, which includes the States of Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa,

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F. J. Sensenbrenner Resigns as President

Becomes Chairman of Board of Kimberly-Clark Corp. After Heading Organization Since 1928 and Cola G. Parker Succeeds To the Presidency — Waste Paper Supply Mounts — Other Late News.

APPLETON, Wis., April 20, 1942—F. J. Sensenbrenner, one of the best known and most prominent figures in the pulp and paper industry, tendered his resignation as president of the Kimberly-Clark Corporation, Neenah, Wis., at a meeting of the board of directors Tuesday, April 14. He is retiring at the age of 77 years, after being associated with the company for 53 years. "In acceding to his request that his resignation be accepted," said a company statement, "the board elected him chairman of the board of directors, in which capacity he will continue to serve the organization and make available to the management his broad knowledge and experience."

Succeeding Mr. Sensenbrenner will be Cola G. Parker, who was unanimously elected by the board to fill the vacancy. Other officers were elected as follows: Ernst G. Mahler, executive vice-president; J. S. Sensenbrenner, S. F. Shattuck and C. H. Sage, vice-presidents; J. F. Hunt, secretary; W. H. Clifford, Treasurer, and F. E. Sensenbrenner, assistant secretary-treasurer.

Became President in 1928

Mr. Sensenbrenner became president of the corporation in 1928, following the death of the founder and first president, J. A. Kimberly, and for many years prior to that time had been the first executive officer of the company. He had worked his way to the top since starting as bookkeeper in 1889. Across the years he has held many positions of honor and trust in the paper industry as well as in public life generally.

Among the other capacities in which Mr. Sensenbrenner has been serving are: President of the Spruce Falls Power and Paper Company, Ltd., Neenah-Menasha Water Power Company, and William Bonifas Lumber Company; director of the International Cellucotton Products Company; president of the North Star Timber Company; director of the First National Bank of Appleton, Wis., and the First National Bank of Neenah, Wis.; trustee and member of the executive committee of the Northwestern Mutual Life Insurance Company, and a director of the Wisconsin Bank Shares Corporation.

Made a Knight of St. Gregory

One distinguished honor that has come to him was to be made a Knight of St. Gregory, a Catholic title bestowed only by the Pope. He is a trustee of Marquette University and on its board of governors; a member of the board of regents of the University of Wisconsin; a member of the Wisconsin Manufacturers Association, the Neenah Club, the Menasha Club, the Milwaukee Club, the Chicago Athletic Club, the Union League and numerous others.

In becoming the head of the Kimberly-Clark organization, with mills at Neenah, Appleton, Kimberly and Niagara, Wis., and Niagara Falls, New York, Mr. Parker is the third to serve as its president. He entered the legal profession after graduation from the University of Chicago law school, and later served as counsel to the American Paper and Pulp Association and other organizations in the paper industry. During this time he not only performed service directly for Kimberly-Clark Corporation, but contacts with members of the Kimberly-Clark management were formed which led to his association with the corporation in the fall of 1937 in the capacity of vice-president, director and member of the executive committee. He was located in New York City at that time.

Paper Salvage Drives Most Successful

So extensive has been the waste paper salvage in some localities that dealers are beginning to call a halt on further deliveries. One of these centers is Milwaukee, Wis., where in the last two weeks the market has changed from one of scarcity to one of abundance, according to C. M. Winneman, manager of the Milwaukee Waste Paper Company.

"Paper is coming out fast," he said. "Conversion of their factories to war production has caused many owners to cancel orders for packaging material. Now mill supplies of scrap are mounting and consumption is dropping."

An example of the situation was cited by Mr. Winneman, who said one Milwaukee mill had 55 to 75 cars of waste paper on track at one time, paying high demurrage and threatened with withholding of cars by the railroad unless some of those on sidings were unloaded.

"Mills which a few weeks ago grabbed any kind of paper they could get now want only top grade, and it must be packages to suit them," said Mr. Winneman.

W. R. Cloud, manager of the U. S. Paper Mill, De Pere, Wis., declared, however, that he was still buying all the waste paper he could obtain. He points out that although there may be congestion in some Wisconsin areas, this state is one of the smallest using waste paper for processing, adding that one Chicago mill has greater daily capacity than all Wisconsin plants combined. Should new government orders be received for shell case tubes, the output would be taxed.

Corrugated box manufacturers are still experiencing a tremendous shortage of scrap corrugated board for reworking into new cartons.

Production Starts on New Wadding Machine

Production has been started by Kimberly-Clark Corporation on a new crepe wadding machine installed in the modern addition to its Badger-Globe mill at Neenah, Wis., according to S. F. Shattuck, vice-president.

It is the second crepe wadding machine in this plant. The first was installed at the time the plant was erected, and the second one duplicates the original installation.

The new machine, the order for which was placed shortly after the mill started production in January,

1941, is manufacturing wadding for facial tissues, but it is adjustable to the requirements for wadding for sanitary napkins and other products. Sixty additional workers have been added to the payroll because of the increased productive capacity.

Valley Iron Works to Expand

An addition is being built to the foundry building of the Valley Iron Works Company, Appleton, Wis., at an estimated cost of $3,500. It will be 15 by 58 feet in size, and 15 feet high, and will be built of concrete and concrete blocks. A frame wall of the present foundry will be removed.

Ernst Mahler on Advisory Committee

Ernst Mahler, executive vice-president of Kimberly-Clark Corporation, Neenah, Wis., has been named a member of the 20-member pulp and paper industry advisory committee of the War Production Board. He is one of three who will represent newsprint producers.

C. B. Clark Heads Neenah Club

C. B. Clark, president of the Riverside Paper Corporation, has been elected president of the Neenah Club at Neenah, Wis. The annual dinner was held last week.

S. W. Mead on Bank Directorate

Stanton W. Mead, vice-president and general production manager of the Consolidated Water Power and Paper Company, has been elected to the board of directors of the First National Bank, Wisconsin Rapids, Wis.

Appoint Advisory Paper Committee

WASHINGTON, D. C., April 22, 1942—The Bureau of Industry Advisory Committees of WPB today announced the formation of the Pulp and Paper Industry Advisory Committee. David Winton, Chief, Pulp and Paper Branch, is Government Presiding Officer.

Committee members are: W. J. Alford, Jr., Continental Paper Company, Ridgefield Park, N. J.; Walter J. Bergman, Lily-Tulip Cup Corporation, New York, N. Y.; H. S. Dennison, Dennison Manufacturing Company, Framingham, Mass.; George E. Dyke, Robert Gair Company, New York, N. Y.; E. E. Grant, Crystal Tissue Company, Middletown, Ohio; Willard J. Henry, Southern Advance Bag and Paper Company, Chicago, Ill.; Walter A. Starr, Soundview Pulp Company, Everett, Wash.; D. L. Luke, Jr., West Virginia Pulp and Paper Company, New York, N. Y.; Ernst Mahler, Kimberly-Clark Corporation, Neenah, Wis.; Arthur L. Hobson, St. Croix Paper Company, Boston, Mass.; Clyde B. Morgan, Eastern Corporation, Bangor, Maine; W. Irving Osborne, Jr., Cornell Wood Products Company, Chicago, Illinois; D. H. Patterson, Fibreboard Products, Inc., San Francisco, Cal.; Robert F. Nelson, Glassine Paper Company, West Conshohocken, Pa.; J. T. Roach, Southern Central Company, Memphis, Tenn.; Maxwell D. Bardeen, Lee Paper Company, Vicksburg, Mich.; Glen Graham, Sutherland Paper Company, Kalamazoo, Mich.; E. V. Johnson, United States Envelope Company, Springfield, Mass.; Robert B. Wolf, Weyerhauser Timber Company, Longview, Wash., and Stewart E. Kay, International Paper Company, New York, N. Y.

Charge A. P. W. Paper Co. Misrepresents

WASHINGTON, D. C., April 22, 1942—A. P. W. Paper Company, Inc., Albany, N. Y., is charged in a complaint issued by the Federal Trade Commission with misrepresentation in the sale of toilet tissue and paper towels through the use of the name and emblem of the American Red Cross Society in labeling and advertising its products.

The complaint alleges that the respondent in magazine advertisements, on letterheads and invoices, on packages, cartons and cases containing its toilet tissue and paper towels, and by other means, prominently displays the emblem of the American Red Cross and the words "Red Cross."

The complaint sets forth in detail the history of the Red Cross beginning with the Geneva Convention in 1864, as reflected in various intermediate conventions and concluding with the Geneva Convention of 1929 in which some 45 countries of the world participated. The complaint recites that at the first Geneva Convention it was agreed that a distinctive and uniform flag be adopted for hospitals, ambulances and evacuations, together with arm bands or brassards, the flag and arm bands to bear a "Red cross on a white ground." The complaint further points out that at subsequent conventions the provisions of the first convention were made applicable to various other situations and conditions arising in warfare and the use of the distinctive red cross was extended to such conditions as well as various peacetime activities; that the United States was a party to and participated in such conventions and afterwards ratified the action taken; that nearly all countries of the world have now adhered to the Geneva Convention and the white flag bearing the red cross has now become the protecting symbol of the Red Cross throughout the world.

The complaint charges that the respondent, through the use of the Red Cross name and emblem, misleads and deceives purchasers of its products into the erroneous belief that the respondent company has some connection with, and that its products are endorsed or sponsored by, the American Red Cross; that the American Red Cross is interested financially in the sale of such products and that such products are manufactured in accordance with sanitary standards prescribed by the Red Cross.

According to the complaint, the American Red Cross has never engaged in any commercial enterprise and has never given any manufacturer, wholesaler, retailer or other dealer permission to employ its name or emblem as a trademark or otherwise in advertising, branding or labeling any product.

The complaint further alleges that the extension of the use of the Red Cross name and emblem so as to apply to paper towels as well as to toilet tissue is not "a use for the same purpose and the same class of goods," as required by statute, and constitutes an unlawful use of such name and emblem. Twenty days are allowed to respondent to answer.

Hinde & Dauch Reelects Officers

Officers of the Hinde & Dauch Paper Company with main offices at Sandusky, Ohio, were reelected at the annual meeting held recently. Sidney Frohman is president and executive committee includes Frohman, Maynard H. Murch and H. C. Robinson, the latter two from Cleveland.

Canadian Newsprint Exports Rise Sharply

Power Shortage Threat Attributed Cause of 25 Per Cent Increase In March Shipments To United States — No Signs Now of Immediate Curtailment of Power For Newsprint Mills — Other News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., April 20, 1942—Directly attributed to what has been called "the power shortage threat" in Canada is an increase in the exports of newsprint from Canadian mills to United States publishers in March of 25.1% in tonnage as compared with shipments in March last year, representing 83.2% of capacity, as compared with 77.4% in February and 72.8% in March last year. The total shipped to the United States in March was 266,034, as compared with 212,727 tons in March, 1941. The inference drawn is that publishers are stocking up in anticipation of a shortage later on, and this is supported by returns compiled by the Newsprint Association of Canada showing that apparent stocks of all United States publishers increased 31,556 tons in March and amounted to $629,778 tons at the end of the month.

No Signs Now of Power Curtailment to Mills

As a matter of fact there are no signs of an immediate curtailing of power for newsprint mills, and the exact extent of power rationing that may have to be undertaken later in the year is still uncertain. In working out tentative schedules for deliveries many factors have to be taken into consideration. For instance, some communities are largely dependent on newsprint mill operations, and this will have to be taken into account. In addition the effect on the various individual companies will vary, as such rationing as may be put into effect can be applied only to mills in Quebec and Southern Ontario that are connected with the power grid system which also feeds the aluminum plants.

Water Storage a Power Factor

As has already been pointed out in this correspondence, much will depend upon water storage conditions, particularly in Quebec province, where considerable part of power produced is dependent on stored water. At present storage conditions are favorable. Good rainfall this summer, and generous storage late this year, would lessen considerably the amount of power that would have to be diverted from newsprint mills. In any case it is thought that restrictions in power deliveries to newsprint mills might be in effect for only a temporary period next winter.

Discussing the outlook for newsprint companies in this respect, the Financial Times of Montreal says:

Outlook Difficult to Forecast

"It is somewhat difficult, at this stage, to estimate with any degree of intelligence the outlook for the Canadian newsprint companies as it is affected by the latest developments in the power industry.

"It appears as if power supplies to the newsprint mills are to be reduced to a greater or lesser extent in order that energy required for aluminum production and other metallurgical industries which have a prior call on power supplies because of the importance of their output in the war effort. The extent to which supplies to the pulp and paper mills are likely to be reduced, and the effects such a reduction may have on operations of the companies are, however, questions that cannot yet be answered. It would seem that Quebec companies are more likely to be affected than Ontario mills, especially those on Northern Ontario and at the head of the lakes.

"There are, of course, unknown elements in the situation. Among these is the question of how badly U. S. publishers may want to avoid reducing the size of their publications. It is possible that, if the newsprint buyers in the U. S. were prepared to pay more for their supplies rather than cut down the size of the newspapers, necessary power requirements might be maintained through establishment of new steam plants."

Du Pont—140 Years

A biography of a business under the title, "Du Pont, one hundred and forty years", by William S. Dutton, has just been published by Charles Schribner's Sons, New York, at $3 a copy.

In this 396 page volume, as the foreword states, is revealed the "story of men and goods, of peace and war, of vision and adventure. It is the biography of tens of thousands—named and unnamed, famous and obscure—whose efforts and identities are merged in the record and character of a company unique in American industrial history."

The book opens at the country seat of Pierre Samuel Du Pont at Chevannes, France, whose younger son, Irénée Du Pont, established in 1802, a gunpowder mill on the banks of Brandywine Creek, near Wilmington, Del. Du Pont powder played a leading part in the Revolutionary War, in the War of 1812 and in the Civil War. In the four years of the World War, Du Pont supplied the Allied forces with nearly 1½ billion pounds of military explosives. In the meantime, the use of gunpowder for blasting purposes increased and with the invention of dynamite new and wider application of explosives for industrial use were made.

At the turn of the century, Du Ponts were looking ahead into the field of chemistry. In the following decades the Du Pont name has been associated with thousands of chemical products. From the common materials of coal, water, air, limestone, salt, vegetable oils, cotton and wood, the Du Pont laboratories are synthesizing the building blocks of a new industrial age. The step-by-step progress of the Du Pont business is revealed in the new Du Pont products, which include dyestuffs, viscose rayon yarn, cellophane, synthetic ammonia, photographic film, industrial alcohol, seed disinfectants, lacquers, plastics, synthetic rubber and nylon.

In this inside story of the Du Pont business may be read the ability of private enterprise to meet the challenge of Europe and to achieve for America a large measure of economic independence and self-sufficiency.

Consumer Demand Drops Lower in Chicago

Expected Decline In Paper For Civilian Requirements Reported Most Severe In Book Papers and In Specialties—More Paper Men In Armed Forces — Salesmen Discuss Waste Paper Propaganda.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., April 20, 1942—The consumer demand situation in the Chicago paper market has gone beyond the discussion point and become an actively important matter. Demand in almost all grades with the exception of krafts and a few other lines has shrunken to an alarming point according to local reports and the government business thus far is said not to be sufficient to keep the mills running at top speed. Sulphites are perhaps in the best demand spot—next to krafts—according to local reports but the advertising line of papers is continuing to meet genuine lack of interest on the part of buyers. Specialties which have found a popular market in American homes are also feeling the patriotic fervor of the frugal housewife. Waste papers are finding the going tough and the drive for waste paper continues to hit the snag of a top ceiling price, which, according to reports, is not sufficient to bring vast quantities of the waste paper product into the markets inasmuch as cost of collecting and delivering the paper meets the ceiling price at a point where such an effort is said to be an actual cost.

More Paper Men in Armed Forces

The effect of the war on Chicago's paper trade personnel is again in evidence this week with the notice that H. S. Stone, Jr., head of the Lincoln Paper Company of Chicago has been commissioned a Lieutenant Commander in the Naval Reserve and is already actively participating in his new job. He will be away from the Chicago firm "for the duration" and S. P. Robinson, vice president of Lincoln, is now taking over Mr. Stone's duties until other arrangements have been made. Another change in the firm indicates that Walter Milnamow is now acting as auditor for the company, succeeding T. A. Selogie who is in the Navy.

Salesmen Plan Meeting for April 27

April 27 is indicated as a gala day for the Chicago paper industry as the western division of the Salesmens Association of the Paper Industry has designated its luncheon for that day as an "open house" affair. Justin Waddell, assistant to the president of the Union Bag and Paper Corporation, is to speak to Chicago paper trade executives on economic conditions in Great Britain and many a non-member of the enterprising association is expected to find a way to get invited to this special event at the Hotel Sherman.

Oppose Improper Price Freeze

More than 3000 wires and letters were dispatched from Illinois this week urging Congressmen to use their influence not to approve pending retail price freezing orders without also freezing farm prices and wages and without giving the "lag" problem the full attention it deserves. The paper industry here knows that if the proper variations and "bases" are not specified for manufacturing, wholesaling and retail prices severe financial repercussions will be felt.

Waste Paper Salesmen Discuss Propaganda

The Monday, April 13, meeting of the Salesmens Association of the Waste Paper Industry, western division, is reported to have turned into one of the most thought provoking round table discussions developed in a long time. After hearing the plans of Ray George, golf chairman, for the 1942 season, the sales executives went into a thorough discussion of the effects of propaganda on paper conservation. It seemed to be the consensus of opinion that such propaganda was creating the wrong psychology on the ultimate consumer, inviting the latter to so curtail the buying of newspaper as to cut demand to a minimum while eliminating the possibility of a sufficient supply of waste paper for future needs. In the rag paper industry, for example, the executives present pointed out that instead of printing new insurance policies some States were printing only brief riders on old policies thus removing a hitherto productive source of demand for rag bond. "Conservation has back fired" indicated some of the salesmen who felt that it might be a good idea to popularize the slogan of "Use More New Paper—Save Waste Paper." The salesmen report that propaganda as to the use of paper has curtailed demand to the point where the situation is extremely serious. They indicated, also, that government demand was not sufficient to keep the mills operating at a profitable rate. While no action was taken nor any recommendations made on Monday it is expected that the Association will make some suggestions as to a change in publicity and public relations when the next meeting takes place.

Acquires Sterling Pump Corp.

Peerless Pump Division of the Food Machinery Corporation, Los Angeles, Cal., and Canton, Ohio, announces the acquisition of the Sterling Pump Corporation, Hamilton, Ohio, and Stockton, Cal.

Peerless will consolidate the Sterling plant at Hamilton with the new Peerless manufacturing plant at Canton, Ohio. Sterling's Stockton plant will be merged with the John Bean Manufacturing Company, Division of the Food Machinery Corporation, San Jose, Cal.

According to Vernon Edler, vice-president and general Manager of the Peerless Pump Division, consolidation of the two manufacturing plants will greatly expedite handling of a tremendously expanded volume of pumps on order at both concerns.

In connection with Sterling's purchase by Peerless, it was indicated by Mr. Edler that an unusual development in pump design will soon be made available to the pump market. This development, which portends to revolutionize one of the larger markets in the pumping field, will be announced in the very near future.

Sale of Abitibi Co. Opposed by Minority

Leave To Appeal From Judgment To Sell All Assets Supported By Stockholders and Creditors — Company Now In Prosperous Condition With Net Profit of $9,800,000 Last Year—Other News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., April 20, 1942—Appearing before the Ontario appellate court at Osgoode Hall Monday in behalf of the preferred shareholders, when the Abitibi Power and Paper Company, Ltd., case was resumed, Arthur G. Slaght said: "This is sure death for us. Just as if we were found guilty, the sheriff given his orders and the scaffold erected two months ahead. The sale proceedings are in reality foreclosure proceedings," he said.

Mr. Slaght was supporting the application of the liquidator for leave to appeal to the privy council from a judgment of the Ontario appeal court upholding a judgment of Mr. Justice Middleton. The Middleton judgment ordered the sale of the assets and undertakings of the Abitibi company to enforce a bond mortgage of $48,000,000 increased by the addition of unpaid interest to $71,000,000.

Mr. Slaght recalled the "abortive" sale proceedings before the master when H. J. Symington, K.C., submitted a bid of $30,000,000. This was put in for the bondholders' committee, who would be in a position, he claimed, to turn in their bonds instead of cash.

Even if the bid were $70,000,000, it would be unfair to his clients, Mr. Slaght claimed, because they would be "tied hand and foot." The judgment meant ruin to the minority interests, he proceeded, and owing to the unusual and special circumstances of the case, leave to appeal should be granted.

Abitibi in a Prosperous Condition

The company had continued during the depression, Mr. Slaght said, and the bondholders had submitted a plan for reorganization, and it was not until after the war began that sale proceedings were instituted. The company never was in a more prosperous condition. The bondholders had been paid $6,000,000 and a further payment shortly would be made, bringing the total to $11,000,000. Net profits in 1941, he pointed out, were $9,800,000.

Mr. Slaght also emphasized the fact that Mr. Justice Gillanders in a judgment had dissented from the findings of the court of appeal that the Moratorium Act postponing the sale was ultra vires. He said that on the constitutional ground alone the application for leave to appeal should be granted.

The new act, under which the legislature stated that an appeal should be allowed, provided that there should be an appeal even if security for costs was not given, he said. The liquidator was in a position to give this, and he should not be barred from going forward. The court might find that part of the act was good and part bad. It could discard part and allow the appeal to go forward owing to unusual and special circumstances.

When the court resumed the hearing on Thursday W. Judson, representing the common stockholders, and J. L. Stewart, the general creditors, supported the application for leave to appeal made by D. L. McCarthy, for the liquidator, and which was endorsed by A. M. Stewart and C. R. Magone, for the attorney-general and Mr. Slaght.

Act Providing Appeal Called Invalid

W. N. Tilley, representing Montreal Trust Company, trustee under the bond mortgage, plaintiff in the action, contended that the moratorium act extending the time before sale proceedings to June 30, 1943, and the act providing an appeal to the privy council, were invalid. The newsprint business, he said, was subject to fluctuations, and a court in London was not in as good a position to review the matter as a court here.

"This," said Mr. Tilley, "is an attempt to take to the privy council an interlocutory appeal." If the province wanted to control the court, he proceeded, and say it would give the plaintiff in the action the right to appeal and would direct the court to admit the appeal and in the meantime stay all proceedings, it was raising new ground in a very dangerous direction if countenance was given to the application.

The court consists of Chief Justice Robertson, Mr. Justice Masten and Mr. Justice McTague.

OPA Rules on Newsprint Exports

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., Apr. 22, 1942—Exporters to whom standard newsprint paper was shipped and who made contracts for export resale of such paper prior to April 1, 1942, at prices above the temporary ceiling established on that date, are permitted to complete these contracts as the result of Amendment No. 1 to Temporary Maximum Price Regulation No. 16 (Standard Newsprint Paper), issued today by Price Administrator Leon Henderson.

OPA has found that many exporters who made contracts before the effective date of the regulation for the sale of standard newsprint in export purchased newsprint to fill these contract orders at prices above the ceiling. Accordingly, these exporters faced certain financial loss and their Central American and South American customers, many of whom are newspaper publishers, faced a shortage of supply.

The amendment, which became effective April 21, 1942, permits exporters to complete the contracts and sell the newsprint paper at contract prices providing records are kept in accordance with provisions of the amendment.

David Donovan Receives Commission

David Donovan has left the advertising department of the Interchemical Corporation to receive a commission as Ensign in the United States Navy. He is now on active duty at the Naval Air Station, Jacksonville, Fla.

Elon R. Brown, formerly with Station KMAC, San Antonio, and the Lambert Pharmacal Company, St. Louis, has joined Interchemical's advertising staff.

OPA ESTABLISHES MAXIMUM PULP PRICES

(Continued from page 7)

North and South Dakota, and those parts of Montana, Wyoming and Colorado *east* of the Continental Divide.

SOUTHERN, which includes all parts of the United States south of the Northeastern and Lake Central areas, and east of the West Coast areas.

WEST COAST, which includes the area west of the Continental Divide.

MAXIMUM PRICES APPLICABLE TO WOOD PULP DELIVERED TO CONSUMER MILLS LOCATED EAST OF THE CONTINENTAL DIVIDE EXCLUSIVE OF DENVER, COLORADO

Bleached Softwood Sulphite	$76.00	Northern Unbleached Sulphate	$73.00
Unbleached Softwood Sulphite	$66.00	Southern Unbleached Sulphate	$63.50
Bleached Hardwood Sulphite	$73.50	Bleached Soda Pulp	$66.00
Unbleached Hardwood Sulphite	$63.50	Unbleached Soda Pulp	$62.00
Bleached Mitscherlich Sulphite	$81.00	Groundwood Pulp	$46.00
Unbleached Mitscherlich Sulphite	$72.00	Sulphite Screenings	$38.50
Northern Bleached Sulphate	$86.00	Sulphate Screenings	$38.00
Southern Bleached Sulphate	$79.00	Groundwood Screenings	$30.00
Northern Semi-Bleached Sulphate	$82.00	Northern Unbleached Sulphate Siderunns	$73.00
Southern Semi-Bleached Sulphate	$75.00		
Standard Newsprint Siderunns	$46.00	Southern Unbleached Sulphate Siderunns	$63.50

Prices applicable to consumers mills west of the Continental Divide and including the city of Denver, Colo., will be $6 per short air dry ton less than the maximum prices for wood pulp sold to consumers east of that area.

Maximum Prices and Freight Rates

The maximum prices may be exceeded only if the actual freight charges are in excess of the freight allowances listed in the following table:

	Applying to Producers of Wet Wood Pulp		Applying to Producers Dry Wood Pulp
Area of Production	Below 50% Air Dry Weight	50%-80% Air Dry Weight	Above 80% Air Dry Weight
Northeast	$13.50	$11.50	$ 8.50
Lake Central	$13.50	$11.50	$ 8.50
Southern	$16.00	$14.00	$11.00
West Coast (in area)	$10.50	$ 9.50	$ 7.50
West Coast (out area)	$16.50	$15.50	$13.50

Should the freight charges actually exceed these allowances, the difference may be added to the maximum price.

The maximum price for wood pulp produced in a foreign area and on dock or in a warehouse in the United States shall be the price determined for the area in which the dock or warehouse is located.

The Single Pricing System

The single pricing system was developed by the OPA on the basis of a study of sales of over 500,000 tons of wood pulp of various grades shipped in the fourth quarter of 1941. Representative delivered prices were determined by adding the weighted average net mill realization with the average weighted freight charges obtained for each producing area.

Weighted Average Price for Four Areas

The following table shows the regulation price in comparison with the weighted average net delivered prices for the four areas for the basic grades of pulp:

Regulation Price	Grade	Fourth Quarter Net Delivered Prices N.E.	L.C.	W.C.	S.
$76.00	Bleached Softwood Sulphite	$75.30	$72.93	$76.37	$79.33
$66.00	Unbleached Softwood Sulphite	$64.48	$62.16	$66.95	.....
$73.50	Bleached Hardwood Sulphite	.....	.....	.....	.....
$63.50	Unbleached Hardwood Sulphite	.....	.....	.....	.....
$81.00	Bleached Mitscherlich	.....	.....	.....	.....
$72.00	Unbleached Mitscherlich	.....	.....	.....	.....
$86.00	Northern Bleached Sulphate	.....	.....	$87.72	.....
$79.00	Southern Bleached Sulphate	.....	.....	.....	$78.84
$82.00	Northern Semi-Bleached Sulphate	.....	.....	$83.70	.....
$75.00	Southern Semi-Bleached Sulphate	.....	.....	.....	$83.35
$73.00	Northern Unbleached Sulphate	$71.69	$60.04	$72.57	.....
$63.50	Southern Unbleached Sulphate	.....	.....	.....	$63.51
$66.00	Bleached Soda Pulp	$66.16	.....	.....	$66.52
$62.00	Unbleached Soda Pulp	.....	.....	.....	$61.34
$46.00	Groundwood	$39.77	$40.00	.....	.....

(In the case of hardwood and mitscherlich sulphite and unbleached soda, the prices are tied to other sulphite grades of bleached soda by the normal market differential. The sulphate pulps adjustments have been made to allow for normal market differentials where abnormal factors affected fourth quarter prices.)

Special Table of Prices

A special table of prices that may be charged in sales to the Lend-Lease Administration is listed in the order. These prices are "per short air dry ton f.o.b. cars or producers mills or f.a.s. barge or steamer at the producers mill or mill dock" as the Lend-Lease Administration may direct. Replacement tonnage allocated to consumers or producers by the War Production Board is to be sold at the levels provided for all domestic sales.

Export Sales

In export sales by producers the maximum prices delivered f.o.b. normal port of exit will be those established for domestic sales. A producer must elect in writing a normal port of exit for each mill, which upon approval of the OPA shall thereafter be the f.o.b. point used in determining his maximum export prices. Maximum prices for export sales by others than producers shall be the domestic sale price for pulp produced or that will be delivered f.o.b. actual port of exit.

To these maximum prices an exporter may add (1) the actual cost of packing or special fabrication for export, if such cost is customarily charged as a separate item; (2) the actual cost to the exporter of ocean freight, marine and war risk insurances on sales f.a.s. vessel, f.o.b. vessel, c.i.f. destination or f.o.b. destination; (3) the normal commission or mark-up charged during the period October 1 to October 15, 1941, by the same general class of exporter for buying or for a sale or a delivery of a similar quality, quantity, type and packing, to the same or comparable foreign market, and to a purchaser of the same general class.

Commissions and Retainers

The commissions and retainers paid to manufacturers' export sales agents and export representatives

cannot be included as costs to increase, directly or indirectly, the prices authorized in the regulation.

Producers of certain special grades of wood pulp not defined in the order must obtain OPA approval of proposed prices before sales are made.

The regulation sets forth the procedure by which producers who do not realize adequate mill-net realizations because of high operating costs may file petitions for exception from the maximum prices. This procedure is also outlined for consumers who cannot purchase wood pulp in a foreign area at ceiling prices because of transportation costs; for exporters obtaining certificates from the Board of Economic Warfare that the exception is of political and military necessity, and for producers who incur extra costs in shipping, packaging or for special treatment of orders delivered to the Lend-Lease Administration.

Gets Defense Bond for Suggestion

On April 3d, 1942, at the plant of the Bogota Paper and Board Corporation, River Road, Bogota, N. J., Andrew Benassi, Cliffside, N. J. press operator, was presented with an award of a $100 Defense Bond by the Company. The presentation was made in the presence of his fellow workers by S. R. Cahoon, manager of the Container plants of Robert Gair Company, Inc., New York City. The Bogota Paper and Board Corporation is a subsidiary of Robert Gair Company, Inc.

For the past few years the company has employed the use of a "Suggestion Box" and numerous awards for suggestions have been made to employees.

Employee Benassi's suggestion provided that by a revision in the layout of boxes for die cutting, a reduction in the amount of paper board required could be made. In addition to the Bogota plant, this suggestion will be adopted in the other Gair plants and will, in all probability be followed out by other container manufacturers.

Due to the fact that considerable tonnage of paper board is now required for Defense and Civilian use, the conservation of it is most significant. Because Benassi's suggestion contributes a great deal to National Defense, the Company has in this instance made a special award.

Oswego Falls Corp. Wins Tax Decision

FULTON, N. Y., April 18, 1942—The Oswego Falls Corporation has received notice that a tax of $30,000 levied in 1936 against undistributed profits of the concern has been held erroneous and set aside in a decision by the tax appeals board. The decision is regarded as important, not because of the amount of the tax, but on the questions of law involved. The levy was made by the internal revenue department under the law providing that surplus profits must be distributed among stockholders. The corporation did not declare a dividend in 1936. An appeal from the internal revenue levy was made to the appeal board last June, the corporation contending that it was forced to withhold dividends in 1936 by terms of the contract with the trustee for bondholders. By terms of this contract the corporation was restrained from paying any dividends if such payments would reduce the net current assets below $1,000,000. Payments of dividends would have compelled the corporation to breach its contract agreement with the trustee for the bondholders, it was contended.

How Balls Are Made Round

Under the title of "How Balls Are Made Round", SKF Industries, Inc., manufacturer of ball and roller bearings, Front street and Erie avenue, Philadelphia, Pa., has issued a bulletin explaining how the SKF balls used in its famous ball bearings are made

ATLAS BALL DIV. OF SKF

Brightly polished balls and rollers parade before keen eyes in a scientifically lighted and air-conditioned inspection room. In this model room, girls, wearing white gloves, scan balls and rollers for surface defects with the same degree of visual concentration needed in detecting flaws and scratches on costly jewels.

round. The explanation is made very clear by presenting the information in the form of a trip through the plant and describing, in text and pictures, the various steps in the production of the product. SKF offers to send a copy of the bulletin to any reader of the PAPER TRADE JOURNAL who desires it.

Asten-Hill Trademark Cited

The trademark of the Asten-Hill Manufacturing Company, known as Yang-Yin, is an ancient Chinese seal or symbol. The story of Yang-Yin is included in "Bookvertising", a volume of "85 studies and expert opinion on how to prepare successful bookvertising", just published by Saybrook House, New York.

A review of the booklet published by the Asten-Hill Manufacturing Company, presenting the interesting story of Yang-Yin appeared in the November 7, 1940 issue of the PAPER TRADE JOURNAL.

Celebrates 50th Anniversary

John C. Schoeneck, in charge of the cardboard and envelope department of J. & F. B. Garrett Company, wholesale paper merchants, 239-241 W. Fayette street, Syracuse, N. Y., is celebrating the 50th anniversary of his connection with this concern.

He has no idea of the number of tons of material he handles in a year, not to mention the amount he has handled in 50 years. But he agrees that the present period is the one of the greatest scarcity of paper goods. "But things are easing up lately," he said.

Castle & Overton Office in Holyoke

Castle & Overton, Inc., with offices in New York and Philadelphia, announce that their new office, in charge of Charles R. O'Neill, is located in the Park National Bank Building, 378 High street, Holyoke, Mass., telephone No. 2-6522.

Obituary

Walter B. Hadley Dead

Walter B. Hadley, superintendent of the specialty division of the Sutherland Paper Company, Kalamazoo, Mich., and during his career widely identified with the rapidly growing paper pulp container industry throughout the country, died suddenly of a heart ailment just before noon Sunday April 12 at his home in Hillandale. He was 52 years of age. Mr. Hadley was stricken just after he had finished a late breakfast toward noon.

For the last three years he had been superintendent of the specialty division of the Sutherland Paper Company, a unit which had expanded rapidly under his supervision.

Before he became affiliated with the Sutherland Company, Mr. Hadley was general manager for two years of the Detroit Paper Products Company. His work in the industry had made him one of the leading members in the Pulp and Papermill Superintendents Association.

Born in New York City April 2, 1890, he came to Middletown, Ohio, with his parents when he was a boy of about 10 years of age. It was in that center that he began his rapid rise in industry, having become superintendent of the Gardner Harvey Company, of Middletown.

During successive periods he was general manager of the Mead Corporation plant at Harriman, Tenn.; general manager of the Kellogg Board Company, Chicago; and general manager of the Pioneer Flinkote Company, Los Angeles, Cal., from where he came to Kalamazoo.

John C. Sherman

John C. Sherman, consulting engineer, author of commercial textbooks, one time assistant editor of Youth's Companion and former secretary to Governor Foss, died suddenly April 12 in his home at Attleboro, Mass., after a heart attack at the age of 73.

Mr. Sherman was born in Bucksport, Me., and educated in Bangor, Me., and Washington. He attended Victoria University, Liverpool, England, and Massachusetts Institute of Technology, from which he was graduated in 1895. He did post-graduate work at Johns Hopkins University and joined the Youth's Companion staff in 1908. Two years later he was named editor of Trade Publications for the Westinghouse Company, and later went into the publishing business. In recent years he was engineering consultant for pulp and paper manufacturers in the Attleboro district.

He leaves a widow, Mrs. Mabel Chase Sherman; a son, John P. Sherman, and a grandson.

Joseph S. Ely

Joseph S. Ely, 53, shot and killed himself with a rifle April 14 in a bathroom in his home at 80 Greenacres avenue, Scarsdale, N. Y., police reported. Dr. Amos O. Squire, Westchester County Medical Examiner, pronounced the death a suicide.

Mr. Ely was in charge of sales and promotion of George LaMonte & Son, 57 William street, New York, makers of paper used in printing of checks and securities. A graduate of Williams College and permanent secretary of the class of 1910, Mr. Ely was a member of the Williams Club, the Racquet and Tennis Club, New York; the American Yacht Club, of Rye, N. J., and the Scarsdale Golf Club.

Surviving besides his widow are a son, Lieutenant Clausen Ely, of the Army Air Corps and stationed in Boston, and two daughters, Mrs. Rosamond Spofford, of Sharon Springs, N. Y., and Miss Martha Ely, of Scarsdale.

Indianapolis Reports Good Demand

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., April 13, 1942—The last week saw a continuance of good business in most paper lines, including board and kraft. The kraft demand was exceptionally heavy and supplies generally seemed to be holding up well.

Box factories in central Indiana are working virtually to capacity and for some time have been able to get more nearly adequate raw materials. However, in some instances it has been necessary to suspend operations for a day or two until fresh materials arrive. Virtually none has any appreciable reserve stock nor are they able to build them up. This applies to finished and to raw materials.

Newsprint demand is not as heavy as it has been. Curtailment of much foreign advertising from companies which have been diverted to government work finally is having its effect. The same is true of coated papers used by the printing trade. However, all prices are holding firm. It is expected that there will be a further decline in newspaper demand and the fact that advertising has been curtailed has resulted in an increase in subscription rates by the three local papers. This is something that was not done during the height of the depression.

A radical slump in demand for building paper and roofing was noted in the last week. Further curtailment of construction due to the war effort will be felt in many sections of Indiana that are devoid of defense plants. The local situation is considerably below what it was a year ago and building permits, if conditions do not change, are expected to be less than half those of last year, according to the building commissioner.

Waxed paper demand for the bakery and other allied trades continues good and supplies thus far are adequate.

Mill demand for old rags continued heavy last week and every effort is being made here to conserve both rags and paper. Prices on rags were firm to strong. Waste paper demand continued heavy with prices reflecting the OPA ceiling of $14 a ton to $20 a ton. There are no large supplies available in the local market.

N. E. Paper Men to Hold Outing

BOSTON, Mass., April 20, 1942—Harry J. Dowd, president of the New England Paper Merchants Association, Inc., has appointed the following committee to have charge of the annual spring outing of the organization, Monday, May 18, at a country club in Metropolitan Boston:

William E. Stetson, Jr., Storrs & Bement Company, chairman; John F. Blackman, D. F. Munroe Company, and W. Edwin Porter, Jr., Cook-Vivian Company.

Policies of Paper and Pulp Concerns With Regard to Military Service

The American Paper and Pulp Association, 122 East 42nd street, New York, has recently issued to paper and pulp manufacturers the following interesting statement indicating what the industry is doing in meeting the situation of employees who are entering military service.

Inquiries sent out by the association as to policies being followed in relation to employees entering the armed forces of the United States or Allied Nations brought the following information:

COMPANY A

(1.) Pays employee the difference between his regular salary and army pay for one month.

(2.) Pays usual vacation rights in cash.

(3.) Carries National Service Life Insurance Policy up to equal amount carried in the company's group life policy.

(4.) Agrees to give a bonus of $50 when and if employee is rehired, providing it is within forty days of employee's discharge from the Army. Provided further that this is within six months and forty days of termination of war.

COMPANY B

(1.) Continues group life and accidental death insurance coverage for two months with the company paying the entire cost of the premium.

(2.) After two months, for each thousand dollars of National Service Life Insurance an employee takes out, the company contributes towards the cost of such increase the same amount (approximately one-half) it contributes towards the company group insurance.

(3.) A dismissal wage of the equivalent of one month's wages or salary is paid.

(4.) Under the vacation plan any employee entering military service who has qualified but who has not yet had his current year's vacation, receives his vacation pay in lieu of such vacation period.

The above applies to both salaried and hourly paid employees.

COMPANY C

(1.) Leave of absence will be granted for the duration of the war, or for a specified enlistment period other than "for the duration".

(2.) Maintenance of service record — military service to count as service with the company.

(3.) Each employee (whether salary or hourly paid) with one year's continuous service with the company will receive the equivalent of six weeks' pay upon leaving the company for military service.

(4.) An employee entering military service who is entitled to vacation and who has not had his vacation during the calendar year in which he leaves for military service, will receive his vacation pay in addition to the six weeks' allowance already provided.

(5.) Military service allowance of six weeks' pay will be computed in the same manner as vacation pay. The profit sharing bonus payment will be based on the last bonus figure available at the time employee leaves the active service of the company for military service.

(6.) Lump sum payment shall be made to both salary and hourly paid employees, effective the date they leave for service, but payment will not be made until they advise the company they have been accepted at the induction center.

(7.) For employees who enlisted before December 7, 1941, in any of the various branches of the armed forces for regular enlistment periods, and therefore were not covered in the policy of October 14, 1940, under the Selective Service and Training Act, this policy is made retroactive.

(8.) Employees called to service under the Selective Service and Training Act who were released on account of age (28 years), and returned to the employ of the company only to be recalled to military service since the declaration of war, have already been provided for and no further monetary consideration will be given.

They will, of course, come under the other provisions of this policy as regards leave of absence, maintenance of service record, and restoration to work upon discharge from military service.

(9.) Restoration to Jobs: As provided by law for those inducted into the service under the Selective Service and Training Act of 1940, employees under this policy will be restored to their former positions, or to positions of like status and pay—"unless the employer's circumstances have so changed as to make it impossible or unreasonable to do so, provided: the employee was not in the employ of the company on a temporary basis at the time of entering military service, and he shall have received an honorable discharge from service with the armed forces, and he is qualified to perform the duties of such position, and he makes application for employment within forty days after he is discharged from military service."

COMPANY D

(1.) Continue their group life and accidental death insurance coverage for two months with the company paying the entire cost of the premium.

(2.) After two months, for each thousand dollars of National Service Life Insurance an employee takes out, the Company contributes towards the cost of such insurance the same amount (approximately one-half) it contributes towards the company group insurance.

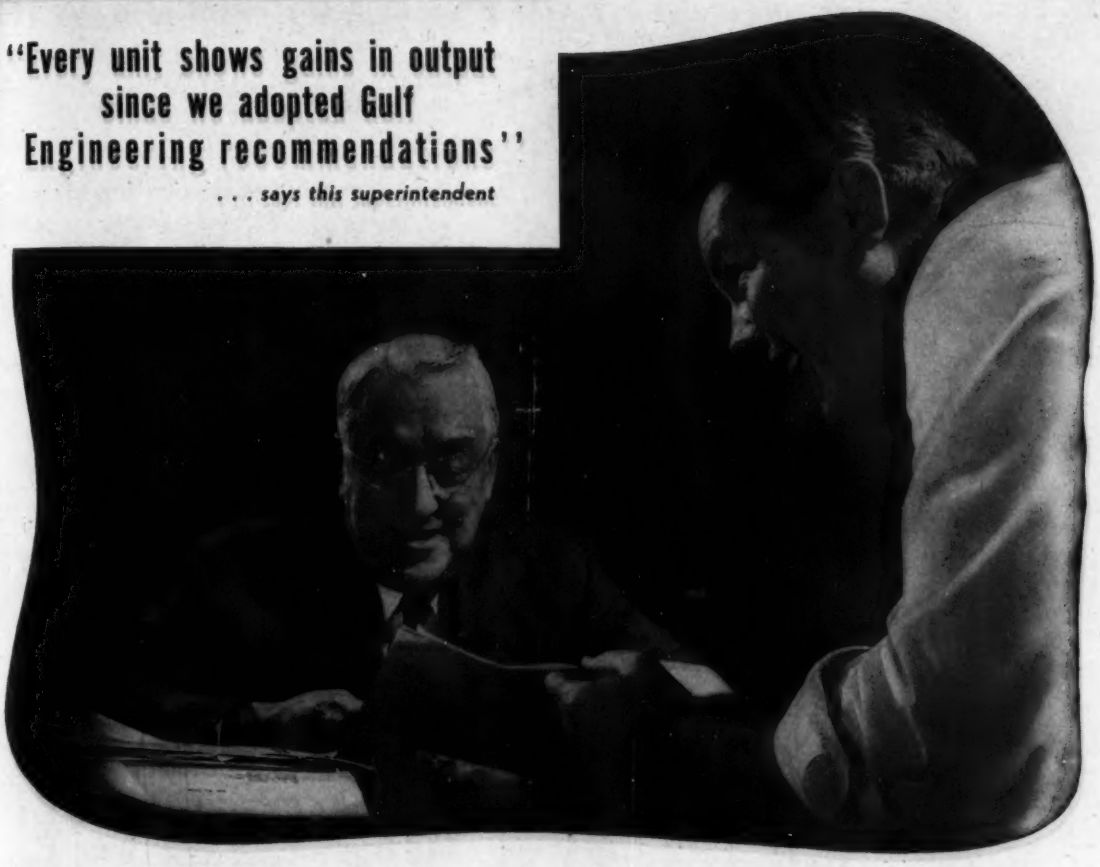
(3.) A dismissal wage of the equivalent of one month's wages or salary is paid.

(4.) Under the Vacation Plan any employee entering military service who has qualified but who has not yet had his current year's vacation, receives his vacation pay in lieu of such vacation period.

The above provisions apply to both salaried and hourly paid employees. As you probably know, some forms of group insurance of which ours was one, have conditions under which that group insurance is not effective, such as foreign service, airplane accident, etc. Therefore, while it first allowed employees to carry their company group insurance we have since changed our policy to agree with the above. This was made effective on January 1st.

"Every unit shows gains in output since we adopted Gulf Engineering recommendations"

. . . says this superintendent



"With proper lubrication our equipment performs better and we have fewer mechanical delays"

"THIS report shows increased output from every unit in the mill since we adopted Gulf engineering recommendations," says this mill superintendent. "With efficient lubrication practice, our equipment performs better, and we have fewer delays from mechanical troubles —which means more equipment time devoted to production."

Reports covering scores of paper mills show that *definite measurable* gains—in both quality and quantity of output—are secured with the help of Gulf Engineering Service and Gulf higher quality lubricants. Fewer production lags and more efficient equipment performance are helping boost paper production to new high levels.

Your mill, too, should get the benefits of Gulf Engineering Service and Gulf quality lubricants. Call in a Gulf engineer now and let him help you find the opportunities for improved production from your equipment and lower maintenance costs. The services of a Gulf engineer—and the Gulf line of petroleum products for every industrial purpose—are quickly available to you through more than 1200 warehouses located in 30 states from Maine to New Mexico. Write or 'phone your nearest Gulf office today.

GULF OIL CORPORATION · GULF REFINING COMPANY · PITTSBURGH, PA.

GULF INDUSTRIAL LUBRICATION

COMPANY E

Enlisted men and draftees serving in the armed forces receive $5.00 at the end of each month's service in 1942. All service men may receive an additional amount after their term of service, possibly as large as, but not to exceed one month's pay.

COMPANY F

Men being drafted or having enlisted in the armed forces received two weeks (80 hours) pay.

COMPANY G

Every employee of the company who has been employed for a period of at least one year who is called or enlists for military service, until further notice, shall be considered as granted a leave of absence during the period of his military service and shall be entitled to the following rights and benefits:

(1.) One week's full pay, or two weeks' full pay if the employee is married with dependents.

(2.) When the employee enters military service his Group Life Insurance will be continued for sixty days, and then cancelled. Thereafter, during his leave of absence, the company will pay to the employee an amount equal to both the company's cost and employee's cost of his Group Life Insurance for the purchase of Government insurance by the employee.

(3.) During his leave of absence, the employee will accumulate seniority the same as if he were not absent from the employ of the company.

(4.) Upon application within forty days after the satisfactory conclusion of his military service, the employee will be reinstated in his previous position or in a position of comparable status and pay, unless circumstances have changed so as to make it impossible to do so.

The above rights and benefits will also accrue to employees who have enlisted or been called for military service since September 15, 1940.

New employees hired to fill places of men who have enlisted or been called for military service must understand that their positions are temporary.

COMPANY H

Pays dismissal wage equivalent to one month's service or salary. In addition, vacation pay in lieu of accrued vacation time is given.

COMPANY I

Pays one week's full pay, or two weeks' full pay if the employee is married with dependents.

COMPANY J

Pays each employee with at least one year's continuous service the equivalent of six weeks' pay. In addition, it gives the vacation pay in lieu of accrued vacation time. Profit sharing bonus payment is made, based on last bonus figures available when employee leaves.

COMPANY K

Pays one month's normal wages or salary less one month's base pay from the Government. Upon reemployment, the employee is paid an additional $50.00. Pay in lieu of accrued vacation time is also given in addition to the foregoing.

COMPANY L

Factory employees are given no compensation in addition to pay for accrued vacation. Employees in the Sales and Administrative Departments are given from two to four weeks' salary in accordance with their status.

There are, no doubt, many other policies in effect similar to the above but we feel these will give those interested enough information to inaugurate a policy of their own if they so desire.

Newsprint Statistics for March

Production of newsprint in Canada during March 1942 amounted to 295,835 tons and shipments to 308,166 tons according to the News Print Service Bureau. Production in the United States was 80,923 tons and shipments 82,176 tons, making a total United States and Canadian news print production of 376,758 tons and shipments of 390,342 tons. During March, 28,000 tons of news print were made in Newfoundland, so that the North American production for the month amounted to 404,758 tons. Total production in March 1941 was 394,244 tons.

The Canadian mills produced 103,166 tons more in the first three months of 1942 than in the first three months of 1941, which was an increase of thirteen and two-tenths per cent. The output in the United States was 14,435 tons or five and six-tenths per cent less than in the first three months of 1941, in Newfoundland production was 7,459 tons or eight and two-tenths per cent less, making a net increase of 81,272 tons, or seven and two-tenths per cent more than in the first three months of 1941.

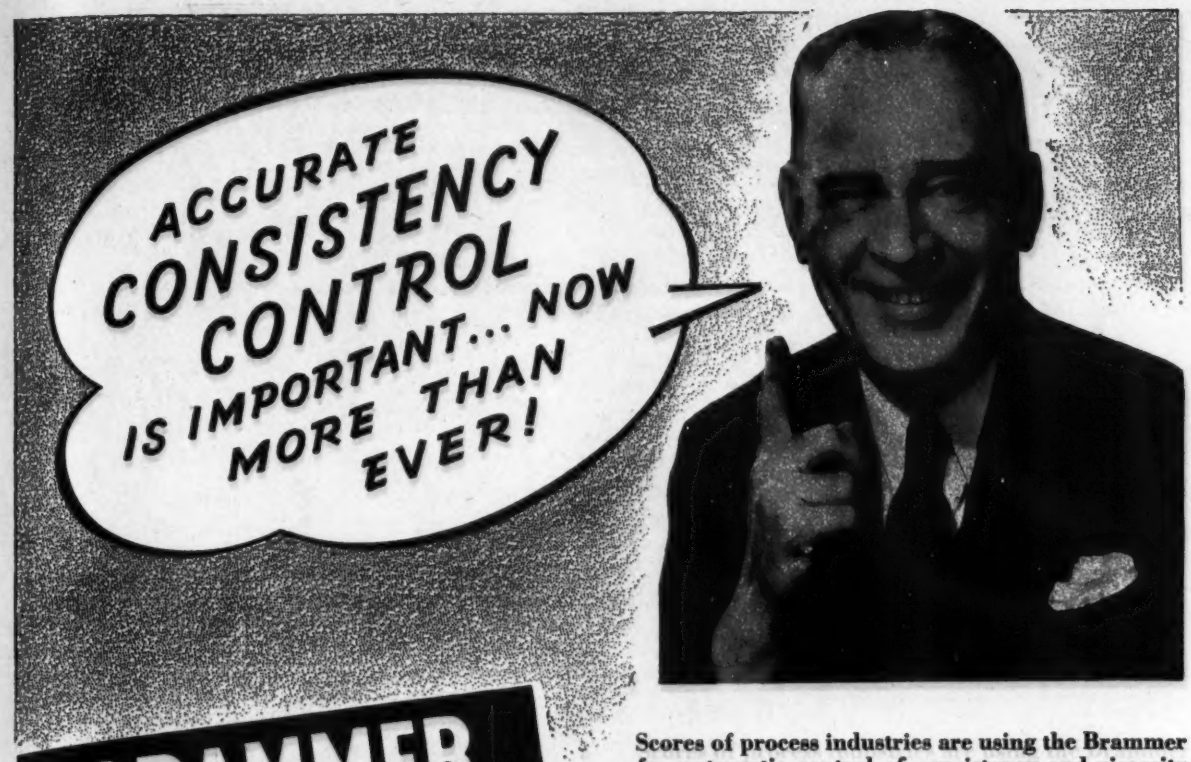
Stocks of newsprint paper at the end of March were 144,626 tons at Canadian mills and 11,161 tons at United States mills, making a combined total of 155,787 tons compared with 169,371 tons on February 28, 1942, and 204,972 tons at the end of March 1941.

Get First Aid Certificates

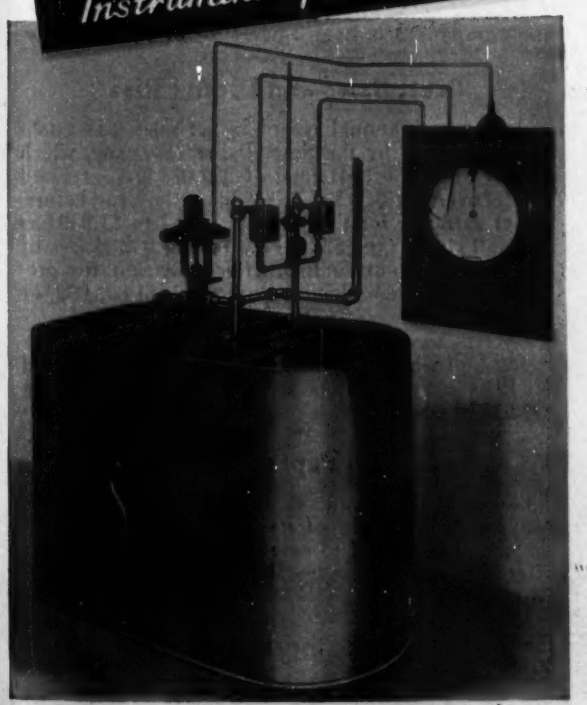
WEST CONSHOHOCKEN, Pa., April 20, 1942—The Glassine Paper Company announces that the following men of their Valley Forge Division have been awarded certificates of proficiency in first aid—Watson Beecher, Planning of Production; Clarence Campbell, Assistant Labor Foreman; C. M. Connor, Technical Director; Frank Capaldi, Rewinderman; Russel Gray, Cutterman; F. Klag, Wax Machine Operator; Willard Lapp, Purchasing Department; Wm. Leichliter, Personnel Manager; Kenneth McCurdy, Laboratory Assistant; James MacMahon, Wax Machine Operator; Malcolm Pike, Wax Department Foreman; Howard Shaw, Bleach Mixer; John Symons, Stock Man; John Thompson, Purchasing Agent; Edward Vaughn, Laboratory Assistant and Harry Worth, Shipper.

The Valley Forge men attended classes every Monday night after work hours on the mill premises and were fortunate in having as instructor Mr. Benjamin Righter, the well known instructor of instructors in first aid. Mr. Righter reports that the class was one of the best he ever had in all his years of teaching, and that is real praise. Later when arrangements can be made Mr. Righter wants some of these men to attend instructors classes and become instructors of first aid.

The Glassine Paper Company states that it is very proud of these men and is presenting each one with a cash award of $25.00.



BRAMMER
RECORDING CONSISTENCY CONTROL
Instrument by FOXBORO



Scores of process industries are using the Brammer for automatic control of consistency and viscosity of heavy liquids . . . chemical, groundwood and rag pulps.

Detects, records and corrects changes in consistency over a wide range without sacrifice of accuracy.

Typical uses are for the regulation of stocks from 8 lb. cigarette paper to 60 lb. roofing felt . . . at consistencies from 1 to 6% . . . including rag stock.

Just air, a Foxboro instrument, and the valve do the work efficiently and dependably . . . maintaining consistency regulation to 1/10th of 1%.

No lubrication required (except water valve stem) therefore minimizing wear and maintenance. Easy to install and operate.

Many repeat orders, twelve by one user, under the most difficult conditions evidence the satisfactory operation of the Brammer Control.

24-hour record, showing consistency before and after diluting water has been added.

If you desire greater uniformity of product, it will pay you to investigate the Brammer now. Write for Brammer literature and list of satisfied users.

Licensed under U. S. Patent Numbers: 1,810,111-1,884,075. Other Patents pending

PAPER and INDUSTRIAL APPLIANCES
Incorporated
122 East 42nd Street, New York, N. Y.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending April 18, 1942

STOCKS

	High	Low	Last
A. P. W.	1⅛	1⅛	1⅛
Armstrong Cork Co.	22¾	22	22½
Celotex Corp.	6⅞	6½	6½
Celotex Corp., pf.	68	67½	68
Certain-Teed Products Corp.	2	1⅞	2
Certain-Teed Products Corp., pf.	26½	25⅛	25⅛
Champion Paper & Fibre Co.	96½	96½	96½
Champion Paper & Fibre Co., pf.	....	....	....
Congoleum Nairn Co.	13⅞	12⅜	12⅜
Container Corp. of America	12½	12⅛	12¼
Continental-Diamond Fibre Co.	7½	7½	7½
Crown-Zellerbach Co.	11	10½	10½
Crown-Zellerbach Co., pf.	....	....	....
Flintkote Co.	11½	10⅞	11¼
Robert Gair	1⅞	1⅜	1⅜
Robert Gair, pf.	9½	9½	9½
International Paper Co.	11¾	10⅞	11½
International Paper Co., pf.	53	51	52
Johns-Manville Corp.	56⅛	52⅜	53¼
Johns-Manville Corp., pf.	125	125	125
Kimberly Clark Corp.	....	....	....
MacAndrews & Forbes	17¼	17	17
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	25	24¼	24½
Mead Corp.	6⅞	6½	6½
Mead Corp., pf.	75	75	75
Paraffine Companies, Inc.	....	....	....
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	9¼	8½	8½
Rayonier, Inc., pf.	25	24¾	25
Ruberoid Co.	17⅜	17	17
Scott Paper Co.	26½	25½	26½
Scott Paper Co., pf.	113	112⅞	112⅞
Sutherland Paper Co.	18¼	18½	18½
Union Bag & Paper Corp.	8⅜	7⅞	7⅞
United Paperboard Co.	3	3	3
U. S. Gypsum Co.	45⅝	43	43¾
U. S. Gypsum Co., pf.	164	164	164
West Virginia Pulp & Paper Co.	14	14	14

BONDS

Abitibi Pulp & Paper Co. 5s '53	59½	50	51
Celotex Corp. 4½s '47	96	96	96
Certain-Teed Products Corp. 5½s '48	87½	86⅝	86⅜
Champion Paper & Fibre Co. 4¾s '50	....	....	....
Champion Paper & Fibre Co. 4¾s '50	....	....	....
International Paper Co. 6s '55	105½	104¾	104¾
International Paper Co. 5s '47	103½	103½	103½
Mead Corp. 4½s '55	....	....	....
West Virginia Pulp & Paper Co. 3s '54	103	103	103

New York Curb Exchange

High, Low and Last for Week Ending April 18, 1942

STOCKS

	High	Low	Last
American Box Board Co.	....	....	....
Brown Co., pf.	....	....	....
Great Northern Paper Co.	30	30	30
Hummel-Ross Fibre Corp.	....	....	....
National Container Corp.	8⅜	8⅜	8⅜
St. Regis Paper Co.	1⅞	1¾	1¾
St. Regis Paper Co., pf.	107	107	107
Taggart Corp.	3	2¾	2¾

BONDS

American Writing Paper Co. 6s '61	....	....	....

Johns-Manville Earnings Up

The report of the Johns-Manville Corporation and its subsidiary companies for the first quarter of this year, issued yesterday by Lewis H. Brown, president, reveals an increase of 31% in net sales to $21,883,773 from $16,713,047 in the corresponding three months of last year.

Earnings before income and excess profits taxes were $3,883,758, a gain of $683,278 over the same period of 1941, when they totaled $3,200,480. The provision for income and excess profits taxes for this year's period was $3,187,423, compared with $1,638,892 for the same period last year, an increase of 94%.

"The provision for income taxes in the first quarter of 1941 was less than the requirement as finally determined when the 1943 Revenue Act was enacted," Mr. Brown said. "The profit for the first quarter of 1942 is an estimated amount which is believed to be sufficient to anticipate the requirement of the rates to be provided for 1942."

Consolidated earnings after taxes for the March quarter this year amounted to $696,335, equal, after preferred dividend requirements, to 77 cents a common share. This compares with $1,561,588, or $1.73 a common share, in the initial quarter of 1941.

As in previous years, the statements of the foreign subsidiaries other than Canadian have been excluded from the consolidated financial statements, Mr. Brown said.

The Johns-Manville Credit Corporation, a wholly owned but unconsolidated subsidiary which purchases home-modernization notes from contractors and obtains repayment from home owners on a deferred-payment plan, reported net earnings of $27,937 for the March quarter this year, against $32,615 for the similar quarter of 1941.

D. J. Murray Mfg. Co. Elects Officers

F. C. Boyce was re-elected president of D. J. Murray Manufacturing Company, Wausau, Wisc., at the annual meeting of the board of directors in Wausau the last week of March. M. P. McCullough, Chicago, was re-elected vice president; J. S. Alexander and C. E. Staky, both of Wausau, were again re-elected treasurer and secretary respectively. Mr. Staky is general manager of the company.

In February at the annual stockholders' meeting all directors were re-elected. In addition to the officers named above, D. C. Everest, W. L. Edmonds and Grover Keeth are directors of the company.

Reports to the directors show that for several years the company has been operating at full capacity.

Scott Sales and Profits Rise

A new high annual record in net sales was established last year by the Scott Paper Company, which reported that the 1941 total of $27,075,888 increased 32.7% over the $20,397,720 volume the year before.

Net earnings for the year amounted to $1,939,629 after all charges, or $2.52 each on 667,942 shares of common stock outstanding, after provision for preferred dividends. This compares with $1,896,052, or $2.46 a common share, earned in 1940.

Current assets on December 31 amounted to $9,094,982, of which $1,878,495 was in cash. At the end of 1940, current assets were $7,035,892, including $952,157 cash.

M. & O. Paper Co. Moves

Offices of the Minnesota and Ontario Paper Company, including those of its insulite and other divisions, will be moved to new quarters in Minneapolis after occupying the same location for the past 19 years.

New M. and O. headquarters on the fifth floor of the Baker Building, Second avenue and Seventh

NOTES ON CONSERVATION OF CRITICAL MATERIALS... No. 2

A key man in the battle of production is the storekeeper. In charge of the "arsenal of material," he zealously guards supplies of critical materials such as Monel, Nickel, Bronze, Copper and other corrosion resisting alloys used for pulp and paper-making equipment. Yet even greater care must be exercised when necessity demands exchange or substitution of these materials. Just as low octane gas in place of high can ruin a high compression aircraft motor, so, too, can the wrong combination of metals give trouble. For your assistance in making proper selections we offer the following as a guide:

As paper industry machinery engineers know, *where corrosion is a factor* it is poor practice to place in contact with each other two metals of greatly differing composition. It is true that different metals are used together in screens, fourdriniers, jordans, valves and pumps without causing trouble. These combinations are successful because they are made in accordance with engineering principles which take into account the factors influencing galvanic corrosion. Technical information on this subject will be forwarded on request. Among the rules to be observed in using substitute materials are those listed below. The International Nickel Company, Inc., 67 Wall St., New York, N. Y.

PERMISSIBLE METAL COMBINATIONS

DO...

1. Check carefully that substitute material has adequate corrosion resistance.

2. When using dissimilar metals together make certain they form a safe galvanic couple.

(*a*) Under most conditions combinations of Monel, Bronze, Brass, and Copper are safe.

(*b*) Usually small areas of Monel or Bronze may be combined with large areas of steel or cast iron, such as Monel bolts in steel machine rails or Monel pump shafts with iron or alloy iron impellers.

DON'T...

1. Never combine metals or alloys whose composition and relative corrosion resistance are not known to you.

2. Do not combine large areas of Monel, Bronze, Brass or Copper with small areas of steel, such as steel rivets in Monel screen plates, or steel nails in Monel sheet.

3. Do not weld corrosion resisting alloys with welding rods other than recommended for their use.

MONEL

"Monel" is a registered trade-mark of The International Nickel Company, Inc., which is applied to a nickel alloy containing approximately two-thirds nickel and one-third copper.

INCO NICKEL ALLOYS *ARE YOUR ALLIES*

MONEL • "K" MONEL • "S" MONEL • "R" MONEL • "KR" MONEL • INCONEL • NICKEL • "Z" NICKEL

Sheet... Strip... Rod... Tubing... Wire... Castings

street, will be ready for occupancy about June 1, according to R. W. Andrews, senior vice president. Since 1923, company offices have been located in the Builders Exchange, 609 Second avenue South, Minneapolis.

Occupying 16,000 square feet of floor space, air-conditioned and equipped with modern lighting, the new general office will be essentially an open one, 65 feet wide by 230 feet long. Ceilings will be covered with insulite acoustilite to minimize office noise.

An unusual feature will be a specially-designed room opening directly off the lobby. Finished with insulite, three of the four walls will contain photo murals of North Woods scenes.

Only enclosed private offices will be those of the president and a board of directors room. Other executive quarters will consist of low-paneled rooms ranging along the side wall of the main office.

The new headquarters which will house more than 150 executives and employes will give the effect of a large open area, although it is designed to provide economy of desk space and minimize inter-office movement and communication.

A large storage room in the basement with truck loading facilities, parking and restaurant accommodations in the same building are other features of the new location.

Port Huron Nets $1.57

The Port Huron Sulphite and Paper Company for the year to January 31, reports a net income of $206,850, equal after preferred dividends, to $1.57 each on 100,017 common shares, against $171,228, or $1.22 a common share in year to January 31, 1941; net sales increased to $3,649,548 from $2,790,133.

Nekoosa-Edwards Profits Up

The Nekoosa-Edwards Paper Company for 1941, reports a net income of 751,784, or $11.93 each on 63,000 shares of capital stock, against $558,986, or $8.87 a share in 1940; net sales, $9,863,554, against $7,482,563. Current assets at year-end totaled $4,835,625, against $3,402,452, at close of 1940, and current liabilities were $1,897,759, against $847,098.

Nashua Earns $12.23

The Nashua Gummed and Coated Paper Company for 1941, reports a consolidated net income of $563,448, equal to $12.23 each on 46,058 common shares outstanding against $368,030, or $7.69 a common share, in 1940. Current assets on December 31 last, $3,631,005 and current liabilities, $1,319,935.

Soundview Pulp Earns $1,794,006

The Soundview Pulp Company for 1941 reports a net income of $1,794,006, equal after preferred dividends, to $3.42 each on 488,250 common shares, against $1,821,994, or $3.47 a common share in 1940; net sales, $13,019,411, against $11,502,377.

MacAndrews & Forbes Loses

MacAndrews & Forbes for the March quarter, reports a net profit of $146,465, equal, after dividend requirements on 6% preferred stock, to 38 cents each on 303,894 common shares, against $222,802, or 63 cents a common share, last year.

Southern California Elects Officers

Papermakers and Associates of Southern California met April 9 at Carl's Restaurant, Los Angeles, Cal., for their first annual business meeting and election of officers. In the absence of Chairman H. L. Joachim, vice chairman, U. Grant Farmer presided over the meeting. Following the dinner, reports by officers and Committee chairmen were read. Nominations were then made for officers and the election held.

Officers elected for the coming year were as follows: U. Grant Farmer, chairman; Charles G. Frampton, vice chairman; Frank H. Wheelock, secretary-treasurer; Floyd W. Adams, Executive Board Member; J. Van Ounsem, Executive Board Member; H. L. Joachim as retiring chairman automatically became the sixth member of the board.

Those present at the meeting were:

A. H. Hatch, V. P. Cole, and C. T. Hazleton, Frank Eggert, California Oregon Paper Mills; J. W. Genuit, Jack Jamison, W. C. Zietz, R. S. Buckley, R. A. Baum, C. G. Frampton, and E. G. Swanberg, Fernstrom Paper Mills, Inc.; F. H. Wheelock, B. F. Brown, Jr., E. J. Toliver, Geo. Ford, W. G. Axtell and U. G. Farmer, Fibreboard Products, Inc.; G. C. Brown, J. Van Ounsem, R. L. Culp, R. E. Cooper, W. Belleman, W. A. Kinney, and F. E. Dilley, Pioneer Division, The Flintkote Company; J. E. Hartford, R. A. Clayton, F. W. Adams and F. L. Mark, U. S. Gypsum Company; Homer L. White, Great Western Div., Dow Chemical Co.; Lloyd Ramsey, Adhesive Products Co.; Geo. Cunningham, National Oil Products Co.; Archie Schwartz and Parke Math, California Ink Co.; W. Monette, Dicalite Co.; Tom Rhodes, Pacific Pulp and Paper Industry; Milo Harding, The Harding Co.; Bruce Wallace, The Foxboro Co.; M. E. Campbell, J. E. Pearson, John Fogal, and Frank D. Frampton.

Pacific Mills to Build Houses

Expenditure of about $450,000 is to be made within the next few months by Pacific Mills, pulp and paper producers at Ocean Falls, B. C., following completion of plans by company engineers and approval of the work by federal authorities at Ottawa.

General contract rests with J. Galloway & Sons, and James L. Galloway is now at the upcoast paper town supervising this and other work.

According to R. Young, resident manager at Ocean Falls, the program will comprise 50 duplex houses; conversion of the dock structure; conversion of four Japanese dormitories, Japanese pool hall, recreation hall and steam plant building.

Connecticut Valley Div. to Meet May 2

The Connecticut Valley Division of the American Pulp and Paper Mill Superintendents Association will hold its spring meeting at the Weldon Hotel, Greenfield, Mass., Saturday afternoon and evening, May 2, 1942 with a dinner and dance after the meeting. An especially attractive program has been arranged by Ollie Messner, chairman. The meeting will open at 2:00 P.M. and will include a round table discussion on mill problems and the showing of movies by the Albany Felt Company. There will be a bridge party under the direction of Mrs. Messner for the ladies and golf for the men.

CONSTRUCTION NEWS

Miamisburg, Ohio — The Miamisburg Paper Company, manufacturer of envelope papers, bristol and kindred stocks, has completed plans for new addition to mill, consisting of a one-story structure, about 121 x 135 feet, to be used primarily for expansion in storage and distributing departments. Cost reported over $50,000, with equipment. Erection contract has been awarded to A. P. Ziegler, Dayton, Ohio, and work is scheduled to begin at once. W. Ray Yount, Third National Bank Building, Dayton, is consulting engineer. Company is a division of American Envelope Company, West Carrollton, Ohio.

Phillipsburg, N. J. — The Canister Company, North Broad Street, manufacturer of fiber boxes, cans and other containers, has plans under way for large addition to plant, to be used for production for Government. It will be one-story, reported to cost in excess of $350,000, with equipment. Financing will be provided by Defense Plant Corporation, Washington, D. C., a Federal agency. Bids are scheduled to be asked soon on general erection contract. P. Beidler, Main and Broad streets, Bethlehem, Pa., is architect.

Kansas City, Mo.—The Phenix Box and Label Company, 1632 Central avenue, manufacturer of folding paper boxes and containers, labels, etc., has begun erection of new plant on local site near Penn avenue and Fortieth street, previously referred to in these columns. It will be one-story, about 50 x 175 feet, reported to cost approximately $60,000, with equipment. Construction is being carried out by day labor. Robert J. Raney, Union Station Building, Kansas City, is architect.

Milwaukee, Wis.—The Milwaukee Lace Paper Company, 1306 East Meincke avenue, manufacturer of lace papers and kindred paper goods, is awarding a number of sub-contracts through Charles Salb Construction Company, Inc., 2045 North 49th street, Milwaukee, general contractor, for proposed new addition to plant, previously referred to in these columns. An award for reinforcing steel for concrete work has been made to W. H. Pipkorn Company, 1548 West Bruce street. Structure will be one-story, 70 x 120 feet, and is reported to cost over $50,000, with equipment. Work is scheduled to begin at early date. Charles F. Smith, 739 North Broadway, is architect.

New York, N. Y.—Tacoma Paper Box Company, Inc., recently organized with capital of 250 shares of preferred stock and 100 shares of common stock, plans operation of a local plant for production of a line of paper boxes and containers. New company is represented by Godfrey & Marx, 42 Broadway, New York, attorneys.

Vancouver, B. C.—Vancouver Paper Box Company, Ltd., 509 Bank of Nova Scotia Building, manufacturer of paper boxes and containers, has plans under way for new plant on local site, to be one-story, reported to cost close to $45,000, including equipment. Bids will be asked soon on general erection contract.

Toronto, Ont.—The Dominion Envelope Company, Ltd., 130 Dundas street, manufacturer of commercial envelopes and other paper stocks, is completing construction of new one-story building on Ontario place, about 70 x 140 feet, previously referred to in these columns, and will have structure ready for occupancy in near future. It will be used largely for storage and distribution, and is reported to cost approximately $60,000, with equipment. Erection contract is being carried out by Toms Contracting Company, 10 Lake Crescent, Mimico, Ont.

Red Rock, Ont. — The Brompton Pulp and Paper Company, Ltd., East Angus, Que., manufacturer of kraft, manila and kindred paper stocks, newsprint, etc., is having plans prepared by John Stadler, 1117 St. Catherine street West, Montreal, Que., consulting engineer, for proposed work at mill of the Lake Sulphite Pulp Company, Ltd., Red Rock, lately referred to in these columns. Property was acquired recently from receiver of last noted company, and will be operated as a branch mill. New buildings will be constructed, with completion of existing structures, installation of machinery and miscellaneous work. Cost is reported close to $250,000. Work is scheduled to be placed under way at early date. H. Grinstad, superintendent at company mill at East Angus, will supervise work at Red Rock mill.

Chicago, Ill.—Container Corporation of America, Inc., 111 West Washington street, manufacturer of corrugated and other boxes and containers, folding cartons, etc., has approved plans for remodeling and improving boiler house at folding carton plant at 1301 West Thirty-fifth street. New equipment will be installed to replace certain present apparatus. No estimate of cost has been announced. General contract has been awarded to Earl I. Boysen, 4124 North Springfield avenue, Chicago, and work will proceed at once. Loramir & Douglas, 327 South LaSalle street, are achitects.

Salem, Ore.—The Oregon Pulp and Paper Company, manufacturer of writing and other paper stocks, glassine, greaseproof and other processed papers, has work under way on new three-story building at 185 South Front street, about 95 x 100 ft., for paper box production, recently noted in these columns, and will push structure to early completion. It is reported to cost in excess of $75,000, with equipment. A. A. Siewert, 338 North Winter street, Salem, has the general erection contract.

Paper Men at Quiz Night

BOSTON, Mass., April 20, 1942—Howard Wallingford, of Tileston & Hollingsworth, was the impresario and Warren Jenney, of S. D. Warren Company, an authority on paper at a Quiz Night sponsored by The Bookbuilders, a Boston organization, composed of members of the bookbinding and allied industries, held at the Boston Art Club Tuesday evening, April 14.

PAPER TRADE JOURNAL

Tbis Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Vol. 114 April 23, 1942 No. 17

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

REQUIREMENTS OF TOTAL WAR

Industrial production this month has established a new high record. The sharp rise last month increased the general average 20% higher than last year. The general output is mounting higher and higher as goods for military uses take more and more of the nation's output of a very large proportion of a very large number of materials and products. We are about to experience the full meaning of the dictators' slogan, "guns, not butter," states the Guaranty Trust Company in discussing the economic pattern of total war in the current issue of *The Guaranty Survey*. "And it is extremely vital that we face the facts realistically; that we fully comprehend we are embarking on the program several years late," the article continues. "Our best efforts will be required to make sure that it is not too late, and that the burdens and sacrifices we are facing shall finally result in victory."

Declaring that total war is an economic struggle, *The Survey* goes on to say that, "We face the task of accomplishing in months what our enemies achieved in as many years. We must not only equal their record but must far surpass it. The job can be done, but only if every individual, every industry and every social group contributes its share. To organized business, this contribution involves the drastic curtailment or complete suspension of many activities. It involves the closest regimentation that the Government is capable of instituting on short notice. It involves labor shortages, disturbances to establish industrial relations, plant conversions and expansion of facilities on an enormous scale. It entails difficult problems of finance. It means rising costs and fixed prices, and critical transportation difficulties. For many concerns not capable of quick conversion to war production, it means total and probably permanent disappearance. For the others, it means all the effort and risk associated with great industrial activity, but with little or no prospect of the economic gain for which such activity is ordinarily undertaken."

In reference to the individual, *The Survey* points out that, "For the individual citizen, also, total war means work and sacrifice. New employment opportunities appear, it is true, but in many cases these are in lines for which the worker in a non-essential industry is not fitted by training or experience, and before he can take advantage of them he must go through a period of unemployment followed by a period of preparation. Workers steadily employed often find their incomes either stationary or rising much more slowly than the cost of living. Even those whose incomes increase are confronted with markets where many of the comforts of life are either excluded or rationed, and with tax rates deliberately designed to reduce purchasing power to a level commensurate with the lower standard of living necessitated by the shift of industrial effort to productions of the implements of war."

Lower living standards are in prospect. *The Survey* explains: "The economic prospect that faces the country as it swings into its all-out war effort is one that bears some superficial likeness to the condition ordinarily called prosperity but that in most essential respects more closely resembles depression. Production will be large, but the major share of it will consist of goods that cannot be bought and used by the individual consumer. Purchasing power will be high, but its expenditure will be restricted to the limited range of commodities and services that can or must be spared from the nation's wartime needs for materials and labor. And along with these sacrifices will go a degree of centralized control over business enterprise and the economic life of the individual such as Americans have never known; a control that is acceptable to a free people only because it is recognized as an indispensable means of preserving freedom."

Commenting on the main readjustments yet to come, *The Survey* states in part that, "The economic changes in this country thus far during the present war have not been such as to bring to most of the people a clear realization of the readjustment and disruption that must accompany the war effort still to be made. To a closer view, the differences between the economic effects of war twenty-five years ago and today are startling. These differences arise partly from alterations in military methods and partly from shifts in economic organization. Only after the present war entered its more active phase less than two years ago was it generally realized what revolutionary changes had taken place in military technique. In the last war, mechanized divisions were unknown; airplanes and tanks were semi-experimental auxiliaries to the main fighting forces, and air power as a factor in naval warfare was relatively unimportant. Now these adjuncts are the main essentials to successful military operations."

In conclusion *The Survey* states that, "Total war has a very real economic, as well as military, meaning. This meaning manifests itself in many ways, but taken as a whole it signifies that the economic effects of war today—the effects on business enterprise and on the everyday life of the ordinary citizen—are very different and very much more profound than they were a generation ago. War has become, to a vastly greater extent than heretofore, a struggle of production and supply; and in such a struggle every employer, every employee and every consumer must be depended upon to make his maximum contribution."

Injuries in Illinois Paper Mills

The current report of the Illinois Department of Labor on industrial injuries during January shows 55 such injuries in the paper and allied products division. Fifteen were due to faulty handling of objects, 4 to falls of persons and 23 to machinery. There were no fatalities. The same report listed the average hourly earnings in the state for January (both sexes) as follows: paper boxes, bags and tubes and other paper goods, 69 cents. For men the rate was 77 and 79 cents respectively and for women 49 and 50 cents.

In the paper goods, publishing and printing industry, the 288 reporting firms reported 41,294 workers employed with total weekly payrolls of $1,483,147. The employment showed an increase of 2 per cent in workers and of 0.7 per cent in payrolls for January, 1942 over December, 1941.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks, 1942		Corresponding Weeks, 1941	
March 7	102.5	March 8	91.0
March 14	101.3	March 15	91.8
March 21	103.0	March 22	91.7
March 28	103.0	March 29	94.5
April 4	101.3	April 5	93.5
April 11 (Prelim.)	99.4	April 12	95.0

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1941	85.6	89.7	92.2	96.0	98.7	99.3	94.2
1942	103.8	103.4	*102.5*	...	...	...	...

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1941	101.0	99.7	103.2	106.2	100.4	97.4
1942	...	...	...	...	...	...

COMPARATIVE YEARLY SUMMARIES

	1935	1936	1937	1938	1939	1940	1941	1942
Year to Date	67.9	76.5	89.4	67.3	79.9	85.2	88.9	*102.8*
Year Average	69.9	80.4	79.8	71.5	83.4	85.6	97.4	...

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1937	80	86	86	88	85	77	66	74	69	65	55	45	73
1938	54	60	61	57	58	56	57	66	66	70	65	59	61
1939	60	67	71	69	64	67	63	72	74	84	81	71	70
1940	71	70	69	70	76	79	79	74	72	79	77	71	73
1941	75	81	82	83	84	88	86	94	94	99	98	93	88
1942	102	101	*101*	..	..	..	..	..	..	..	..	..	..

Week ending Mar. 7, 1942—101
Week ending Mar. 14, 1942—100
Week ending Mar. 21, 1942—101
Week ending Mar. 28, 1942—101
Week ending Apr. 4, 1942—100
Week ending Apr. 11, 1942— *93*

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

The Screen Analysis of Pulpwood Chips

A Study of Screening Variables

By C. L. Dickinson[1] and B. E. Lauer[2]

Abstract

The effects of variables upon the screen analysis of pulpwood chips have been studied, and this investigation has yielded information useful in the formulation of a standard method for the screen analysis of this material.

It has been found that either a vibrating or shaking screen was entirely satisfactory for the analysis, that screen plates perforated with round holes gave a much more satisfactory separation of chips, and that air-dry chips were more readily separated than damp ones. The optimum size of sample for any given screen area was determined.

Working drawings of equipment suitable for carrying out the screen analysis of chips are presented.

A variation in the size of pulpwood chips prepared for any of the various pulping processes results in loss, both direct and indirect, to the pulp manufacturer.

The variation in chip size, and the losses, large or small, appurtenant thereto are traceable to any one of a number of the characteristics of mill operation or of the properties of the raw material in use in the individual mill. The chipping operation has the major effect on chip uniformity and such items as chipper speed, angle, length, and size of the chipper spout, knife setting and condition, and the general chipper design all contribute to the quality of chips produced. Chip breaking, rechipping, screening, and even barking may add to the general losses sustained by the production of uneven sized chips. Properties of the wood which influence the variation in chip size are those such as the presence of decay, the moisture content, particularly if either excessively high or low, the occurrence of knots and cross grains, and the size of the wood, both in length and cross section.

Most mill managers are fully aware of these losses and, in an effort to improve the quality of chips, have authorized the laboratory personnel or others in the plant to closely inspect all operations having to do with the preparation of pulpwood chips. Inasmuch as the only practical method of determining chip quality is through a screen analysis, it follows that many pulp mill laboratories are making at least an occasional screen analysis of the pulpwood chips being produced in the plant.

Since there is, at present, no uniform procedure for the screen analysis of chips, the method of making this analysis must vary considerably at the different mills. As a preliminary, however, to describing a suggested method for screen analysis, it is essential that the screening variables be studied in order to learn their effect, if any, on the results. Features such as direction and speed of motion of the screen surface, shape of opening through which chips are screened, size of sample, and the moisture content of the chips must all be considered in outlining a standard procedure.

Apparatus

In general, a screening apparatus may employ any one of, or a combination of, three distinct types of motion of the screen surface. The first of these is a motion perpendicular to the screen surface, the type of movement which is produced by the vibrating screen. The second type is a motion parallel to the screen surface such as is found in the shaking or oscillating screens. The third type is exemplified by the rotary screens. The latter give a movement parallel to the screen surface, but, using a curved screen, cause the material to slide or tumble against the screening medium.

The first two are mechanically suitable for the screen analysis of chips. Since a screen analysis requires a division of the material into 4 to 7 size ranges, it makes the construction of a satisfactory rotating drum type of screen very complicated. A conical type of rotary testing screen designed for the screen analysis of rock is on the market[3] but probably is not suitable for testing pulpwood chips. Due to the low density of the chips, their flat shape, and their relatively high coefficient of friction, a rotating screen must be tilted to such an angle to cause movement of material over the surface that the chips will not readily fall through the holes. In either a shaking or vibrating screen, screen surfaces can be firmly fixed in tray-like frames and as many of these as required securely held in battery to which can be imparted as violent a shaking or vibrating motion as required.

Two screening units were constructed, one to give

[1] Graduate student, North Carolina State College, Raleigh, N. C.
[2] Member TAPPI; Professor of Chemical Engineering, North Carolina State College, Raleigh, N. C.

[3] Hendricks Manufacturing Company.

a rapid vertical motion to the set of screens and the second to shake the screens in a horizontal direction.

Vibrating Screen

The frame of the vibrating screen is supported by four connecting rods and pins impelled by four synchronized eccentrics, one at each corner of the frame. It is kept from tilting on the bearings by means of a guide located near the center of the lower edge of the frame. This gives a positive motion in a vertical direction with little horizontal movement (*see* Fig. 1).

To prevent any slippage while the machine is in use and consequent misalignment of the eccentrics, they are welded to the shaft. Hence, any change of the stroke would necessitate the cutting and construction of new eccentric shafts. For this reason, much thought was directed toward the construction of a unit which would have the correct stroke. It was decided that a short rapid stroke would be as effective as a longer and perhaps slower one, and since there would be smaller momentum built up in the relatively heavy screen frames it would result in less vibration of the entire unit. Consequently, the eccentrics were drilled ⅛ inch off center to give a total stroke of ¼ inch. This was satisfactory.

The speed of the shake was made adjustable by means of a step pulley until a speed which would give effective screening was determined. The step pulley was then replaced by an ordinary V pulley of the correct size.

A ⅓ hp. motor of the repulsion-induction type is of adequately high capacity for both starting and operating the unit.

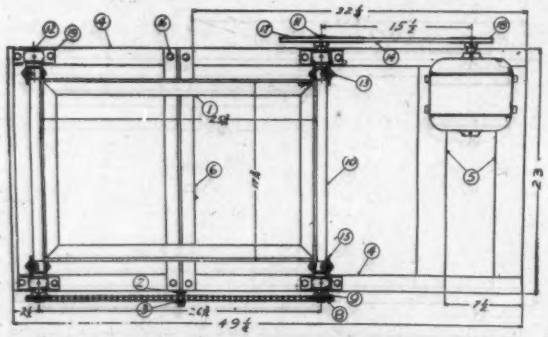
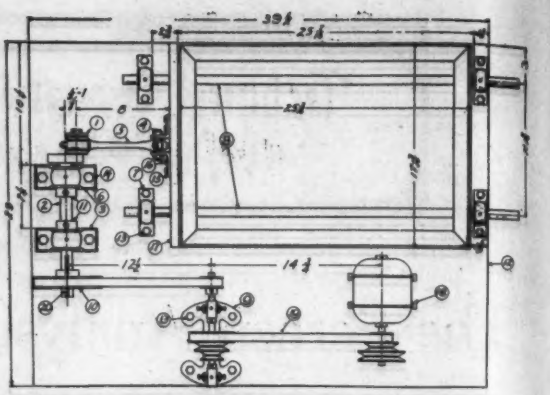


Fig. 1

Vibrating Screen. 1—Guide Clip. 2—Chain Tightener Support. 3—Chain Tightener Idler. 4—Channel Iron Support—4 inches. 5—Motor Supports. 6—Guide Bar—"T"—2¾ inches x 1½ inches x 23 inches. 7—Support Brace. 8—Chain—½ inch pitch, ⅜ inch width. 9—Sprocket—15 Teeth. 10—Thrust Pin Shaft—1 inch x 19¼ inches. 11—Eccentric Shaft—Drive—1 inch x 25⅞ inches. 12—Eccentric Shaft Idler—1 inch x 24½ inches. 13—Connecting Rod (Model "T" Ford) 14—"V" Belt—48 inches. 15—Eccentric Bearing. 16—Bolts—⅝ inch x 2 inches. 17—"V" Pulley—6 inches. 18—"V" Pulley—4 inches. 19—Pillow Blocks—¾ inch.



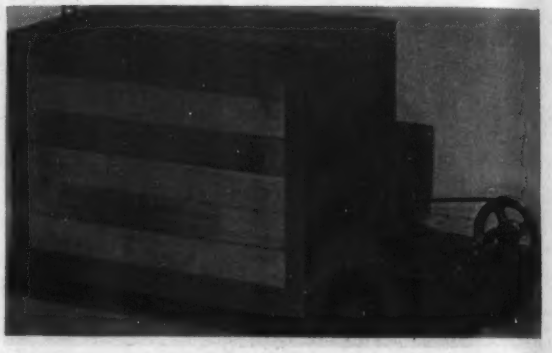


Fig. 2

Shaking Screen. 1—Eccentric Bearing. 2—Eccentric Shaft—1 inch. 3—Bearing Support. 4—Wrist Pin. 5—Connecting Rod (Model "T" Ford). 6—Pillow Block—1 inch. 7—Pillow Block—¾ inch. 8—Shaft—¾ inch x 34¼ inches. 9—Jack Shaft. 10—"V" Pulley—6 inches. 11—Collar. 12—Base Plate. 13—Cap Screws—⅜ inch x 1 inch. 14—Cap Screws—¼ inch x 4 inches. 15—Thrust Pin Support. 16—Cap Screws—¼ inch x 1 inch. 17—Bar—¾ inch x ⅜ inch. 18—Motor—¼ hp. 19—"V" Belt—38 inches. 20—Key—¼ inch x ¼ inch.

Shaking Screen

The frame of the shaking screen is mounted on two shafts supported by four bronze bearings. The shafts slide freely back and forth through the bearings as the frame is driven in a horizontal direction by means of an eccentric, connecting rod and pin.

For purposes of experiment the drive speed is made variable through a jack shaft and step pulleys. The stroke is arranged to be adjusted stepwise by changing the location of the bearing block on the eccentric.

The screen is satisfactorily driven, up to the speed necessary for thorough screen action, by a ¼ hp. motor.

Fig. 2 shows the shaking screen.

Screen Frames

The individual screen frames are constructed of oak and so arranged that they will nest into one another to give a sturdy support for the screen surfaces. Perforated sheet metal is used for the screening medium. One full set of screens punched with round holes (⅛, ¼, ½, ¾, 1, and 1¼ inches diameter holes), and two screens one with ½ inch and one with ¾ inch square openings were built and used. Each screen is of sufficient size to give 14 by 22 inches of free screening area. Assembly of the screen frame is shown in Fig. 3.

Both the shaking and vibrating screens are of such

size as to hold six of the screen frames and a dust tray.

ACCESSORIES

The only additional pieces of equipment necessary for this work are an accurate balance and a stop watch.

A balance of the type used in the Sargeant gas calorimeter was pressed into service and was satisfactory. This balance is of the torsion type, with a capacity of ten pounds. It is equipped with a counterbalanced metal can of approximately one fifth cubic foot capacity and is graduated in thousandths of pounds. It is sensitive to within one half of one scale division.

Sample

The chips[4] used for all the experimental work reviewed in this paper were representative of ⅞ inch chips as prepared for sulphite pulping. The moisture content as received was about 40%.

The sample which was actually used for the bulk of the work was thoroughly air dried. This was done for the purpose of eliminating any possible variations resulting from the chips drying during the period of experiment. This, for a screen analysis, is obviously a departure from mill practice which would, for the most part, require that the analysis be made on freshly chipped and oftentimes quite damp wood. There is little doubt that air-dry chips will screen more readily than damp ones, particularly in a removal of the finer material. However, it is likely that the moisture variation during a series of tests on damp chips may be large enough to cause changes, from this source, in the screen analysis.

The sample was first thoroughly screened (20-30 minutes) and then, in addition, each screen fraction rescreened to be certain that it was made up of chips uniform in size. The lengthy preliminary screening tended to break the more fragile chips and to minimize, thereby, their breakage during the period of test.

Unless otherwise specified, tests were made on composites or on individual fractions of this type of material.

Speed of Operation

As a preliminary to all the work in connection with the screening action the optimum operating conditions of each screen must be determined. This involves for the most part a selection of the slowest practicable speed of the screen surface which will give a reasonably thorough shaking of the chip sample.

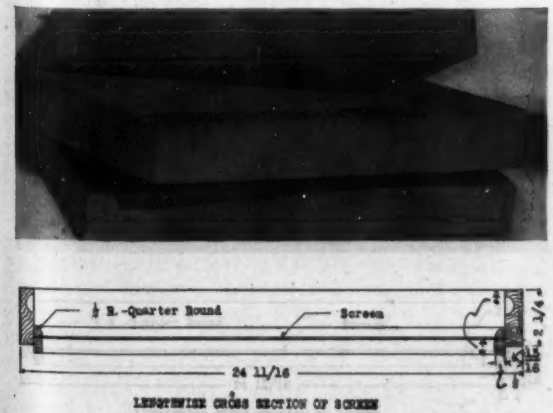


FIG. 3
Screen Frame

VIBRATING SCREEN

The vibrating screen was first arranged to be driven at 430 r.p.m. At this speed the chips travelled up and down with the screen surface almost undisturbed. The speed was changed to 860 r.p.m. and at this faster speed the chips were very effectively raised off the surface and were given a thorough jigging motion by the screen. Faster speeds would mean more rapid deterioration of the equipment and more severe treatment with possible consequent breakage of the chips. The screen was then arranged to be run at 860 r.p.m. at a fixed throw of ¼ inch.

SHAKING SCREEN

Since both the throw and speed of this screen was variable, different combinations were tried. The 1-inch stroke with the slow speed 410 r.p.m. was most suitable. Materially slower speeds on this stroke cause the chips to travel with the screen. A longer stroke gives a considerably greater shock at the end of the throw, even at the slower speeds. Faster speeds at the same stroke, or the same speed with longer stroke reduce the screening efficiency (*see* Table I). The surface is moving more rapidly under these conditions and it would seem likely that the chips have greater difficulty in finding an opening through which they can drop. More rapid screen movement even at the shortest stroke increases the shock to screens, frames, and parts.

Type of Screening Motion

In order to compare the screening action obtained in the two types of screening motion, vibrating and shaking, identical samples of air-dry chips were screened in first one and then the other of the two screens, employing, in each case, the optimum conditions of throw and speed which were previously determined. Results obtained by this comparison are given in Table II.

The chips, for the most part, slide through the screen endwise—i.e., since they are roughly rectangular in shape, and flat, they are caused to stand more or less on end by the motion of the screen surface and then drop or work their way through the screen openings. Since the screen openings in the vibrating screen do not shift horizontally, this screen should be most effective. Data given in Table II, together with

TABLE I.—RELATION OF SCREENING RATE AND OPERATION OF SHAKING SCREEN

Sample: — ½ inch to + ¾ inch fraction, air dry
Screen perforations: ½ inch round
Weight of sample: 0.694 pound

Length of Stroke, inches	Total Shaking Time	Speed, r.p.m.	Weight of Chips Remaining on Screen	Passing Screen, %
½	30 sec.	410	.139	80.0
1	30 sec.	410	.132	81.0
1½	30 sec.	410	.184	73.5
2	30 sec.	410	.210	69.8
½	1 min.	410	.123	82.3
1	1 min.	410	.100	85.6
1½	1 min.	410	.128	81.6
2	1 min.	410	.156	77.6
½	30 sec.	755	.162	76.7
1	30 sec.	755	.269	61.3
1½	30 sec.	755	.298	57.1
½	1 min.	755	.117	83.1
1	1 min.	755	.227	67.3
½	30 sec.	990	.196	71.8

Vibration of screening apparatus extremely severe at strokes greater than 1 inch at 755 r.p.m. and at all strokes at 990 r.p.m.

[4] Furnished by the Champion Paper & Fibre Co.

TABLE II.—COMPARATIVE SCREENING CAPABILITIES OF THE VIBRATING AND SHAKING LABORATORY TEST SCREENS

Air Dry Chips; Weight—2.223 pounds; Volume—0.18 cu. ft.

Sample % Composition

−1¼"	1¼" + 1"	1" + ¾"	¾" + ½"	½" + ¼"	¼" + ⅛"	⅛"
0.7%	5.0%	19.9%	31.4%	31.1%	10.0%	1.9%

Screens—perforated, round holes, diameters as indicated

Screen Used	Period of Test	−1¼"	−1¼" to +1"	−1" to +¾"	−¾" to +½"	−½" to +¼"	−¼" to +⅛"	−⅛"
Shaking	15 sec.	1.4	8.9	21.4	35.3	27.2	5.1	0.7
Vibrating	15 sec.	1.9	5.9	26.7	33.0	25.0	6.4	1.1
Shaking	30 sec.	1.4	6.9	22.2	34.3	28.6	5.8	0.8
Vibrating	30 sec.	0.8	5.3	23.5	33.8	27.8	7.6	1.3
Shaking	1 min.	1.0	6.2	20.6	34.4	30.1	6.9	0.8
Vibrating	1 min.	0.7	5.4	21.8	33.1	29.2	8.4	1.4
Shaking	2 min.	0.7	6.1	19.6	33.4	31.6	7.6	1.0
Vibrating	2 min.	0.7	5.2	20.2	32.7	30.2	9.5	1.5
Shaking	4 min.	0.7	5.5	19.4	32.9	31.8	8.6	1.1
Vibrating	4 min.	0.7	5.0	19.9	31.8	30.8	10.1	1.7
Shaking	6 min.	0.7	5.6	18.9	32.5	32.0	8.9	1.3

visual inspection of the screens in action, substantiates this assumption. However, the difference in screening ability is certainly not great enough to discredit the use of a screen of the shaking type. Either screen with proper timing would undoubtedly be satisfactory as a means of making a screen analysis of chips. Data given in Table II, together with visual inspection of the screens in action, substantiate this assumption. From the results of the test, it would appear that it requires about double the time to achieve results with the shaking screen comparable to those obtained with the vibrating screen. However even this difference in screening ability is not great enough to discredit the use of a screen of the shaking type. Since either type screen would, with correct timing, be satisfactory for the purpose of making a screen analysis of chips, it is likely that any one of the several larger capacity laboratory testing screens offered for sale[3], as well as either of the laboratory screens whose construction is described, would be entirely suitable.

Shape of Opening in the Screening Medium

There is a distinct effort on the part of several of the various boards set up for the purpose of outlining methods of procedure for materials analysis to standardize on a square mesh wire screen for screen analyses. While this type of screen surface is unquestionably suitable for materials roughly globular in shape and is probably satisfactory for cubical particles, it is difficult to imagine that the same would be true for flake-like materials.

Pulpwood chips, as pointed out previously, are flat and approximately rectangular in shape, and pass through the screen opening endwise. Hence it is obvious that a chip may pass diagonally through a square screen opening when both dimensions of its flat side are greater than the square dimensions of the opening. When any opening is used to screen material for a screen analysis, the classification should be made on the basis of the maximum size of particle which will pass the opening, hence the screen opening used for chips should, if square, be logically designated by its diagonal. This might very conceivably be satisfactory were it not for the fact that the diagonal of a square presents the maximum length of opening only to a very thin flake. As a result a thin chip of definite width may pass through the screen; a thicker chip of the same width may be retained. Since the maximum opening is presented at only two directions rather than in any direction, the screening action must of necessity be much slower. Data are given in Table III to verify these assumptions.

TABLE III.—CHIP SCREENING ABILITY OF ROUND AND SQUARE SCREEN OPENINGS

Sample—Screened on screen surface with round perforations
Screening apparatus—Vibrating

Sample	Screen Surface Openings	Time	% of Original Sample Through Screen
− 1" to + ¾"	¾" square	15 sec.	56.1
− 1" to + ¾"	¾" square	1 min.	79.8
− 1" to + ¾"	¾" square	2 min.	87.0
− 1" to + ¾"	¾" square	5 min.	92.1
− 1" to + ¾"	1" round	30 sec.	98.5
− ¾" to + ½"	½" square	15 sec.	15.6
− ¾" to + ½"	½" square	1 min.	38.0
− ¾" to + ½"	½" square	2 min.	48.4
− ¾" to + ½"	½" square	5 min.	55.4
− ¾" to + ½"	¾" round	30 sec.	90.5
− ¾" to + ½"	¾" round	1 min.	95.8
− ¾" to + ½"	¾" round	2 min.	98.3
− ¾" to + ½"	¾" round	4 min.	99.2

The data assembled in Table III indicate clearly that the fractions classified on the screen having round perforations do pass, in part at least, the screen having the same dimensional square openings. Thus, for example, the bulk of a sample of chips in which the smallest flat side dimension of any chip was over ¾ inch passed through a screen having ¾-inch square openings.

In bearing out the assumption that screening would not be as rapid on the square openings the results are conclusive; the chips which did pass the screen, found their way through with appreciably slower speed than they did on the round openings.

Further, it is particularly interesting to note that in the case of the − 1 to + ¾ inch sample in which every chip had one flat side dimension of less than 1 inch, only 92.1% had passed the ¾-inch square mesh screen in five minutes in spite of the fact that the diagonal of this screen is 1.06 inches. On inspection of the chips left in the screen, it was found that the bulk of them could not be pushed by hand through the ¾-inch square opening. In other words, the taper toward the corner allowed thinner chips to pass and retained thicker ones. Since both chips could have had the same length, this represents a variable size of screen opening. Therefore, a ¾-inch square mesh if used for chip separation can neither be classified as ¾ inch because it allows chips larger than ¾ inch to pass nor 1.06 inches because it retains chips shorter than 1.06 inches.

Except for the last conclusion above, similar inferences can be drawn concerning the ½-inch square screen openings. Since the diagonal of the ½-inch square opening is 0.708 inch and is thus slightly shorter than the largest chip, a direct comparison cannot be made between it and the ¾-inch screen in connection with statement in the preceding paragraph.

Another feature which could not be reported as data, and yet was found to be true, was that blinding was much more severe in the square openings than in the round ones. While this is of little consequence in

[3] Gilson Testing Screen, (Vibrating), Gilson Screen Co., Mercer, Pa.
The Hendrick Screen, (Vibrating), Hendrick Mfg. Co., 10 Dundaff St., Carbondale, Pa.
Ty-Lab Tester, (Vibrating), The W. S. Tyler Co., Cleveland, Ohio.
Williams Standard Chip Classifier, (Oscillating), Williams Apparatus Co., Inc., Watertown, N. Y.

the coarser mesh screens, it might, providing it holds on the finer mesh, prove to be quite bothersome.

It is possible that slots, or screen woven into rectangles appreciably larger in one dimension than the other, particularly in the larger sizes, would be as effective and accurate as round openings. However, the comparison of round and square openings clearly indicates that the screen having round openings is preferable. It is quite likely that the greater accuracy and speed obtained on the ¾- and ½-inch screens would not be repeated on the ¼-inch or smaller screens since the chips in these smaller sizes become finer and more matchlike in their dimensions. However, this is not so important since the round openings should be satisfactory even for the finer material and it is rather inconceivable that a screen set would be in made up containing screens having openings of different shapes.

Volume of Sample

The amount of material taken for a sample must have an effect on the results of the analysis. A small sample should logically screen more rapidly than a larger one in the same apparatus. However, to improve accuracy, the largest practicable amount of material should be used for the test. Since the chips are quickly given a rough separation, no individual screen plate would, for any appreciable length of time, retain more than a portion of the total sample. It seems probable, however, that no one screen plate should hold chips to a greater depth than the average width of the chips lying on the screen. Thus, for example, the depth of chips on the ½-inch screen should probably never be over ¾ inch.

The screening ability of the laboratory test screen when used with different volumes of chips is reviewed in Table IV.

TABLE IV.—INFLUENCE OF SAMPLE VOLUME ON SCREENING EFFICIENCY

Screen—Vibrating
Sample—Air Dry Chips

	% Composition						
Composite	—1¼"	—1¼" to +1"	—1" to +¾"	—¾" to +½"	—½" to +¼"	—¼" to +⅛"	—⅛"
1	.7	5.0	19.9	31.4	31.1	10.0	1.9
2	.6	5.0	20.1	31.8	30.8	10.0	1.7
3	.6	4.6	19.7	32.0	31.3	10.0	1.8

Composite	Volume	Weight	Volume per sq. ft. of screen area
1	0.18 cu. ft.	2.223 lbs.	0.084 cu. ft.
2	0.27 cu. ft.	3.315 lbs.	0.126 cu. ft.
3	0.36 cu. ft.	4.392 lbs.	0.168 cu. ft.

		Screen Fraction %						
Composite	Screening Period	—1¼"	—1¼" to +1"	—1" to +¾"	—¾" to +½"	—½" to +¼"	—¼" to +⅛"	—⅛"
1	1 min.	0.7	5.4	21.8	33.1	29.2	8.4	1.4
1	2 min.	0.7	5.2	20.2	32.7	30.2	9.5	1.5
1	4 min.	0.7	5.0	19.9	31.8	30.8	10.1	1.7
2	4 min.	0.6	4.9	19.9	32.8	30.7	9.5	1.5
2	6 min.	0.6	4.9	19.4	32.5	31.0	9.9	1.7
2	8 min.	0.6	4.6	19.5	32.0	31.4	10.0	1.9
3	2 min.	0.7	4.6	23.1	35.8	26.0	8.3	1.5
3	4 min.	0.6	4.6	20.5	35.7	28.1	8.9	1.6
3	6 min.	0.6	4.5	19.8	34.2	30.0	9.3	1.6

The results given in this table indicate that the larger sample does decrease the screening rate. The retention is particularly evident on the ½-inch screen, and in the case of the largest sample, even becomes appreciable on the ¾-inch screen. In view of these results, it seems probable that the largest sample which can be effectively screened in a relatively short time in this type of operation would be somewhat smaller than the intermediate sample used in the test. On the basis of the laboratory screen which was used, this would amount to 0.1 to 0.125 cu. ft. of chips per square foot of screen area per screen. This volume should be reduced if it is found that any one screen plate is retaining appreciably over one-third of the chips taken for the analysis. It can readily be seen that this volume would permit a depth of chips up to about ½ inch to be held on any individual screen. It seems reasonable that chips would not easily separate in depths greater than this.

Moisture Content of Chips

The moisture content of the chips may alter the results of a screen analysis if some arbitrary time and conditions are outlined. The chips, particularly the finer ones, tend to cling together and thereby resist separation on the screens. Results of a comparison of the screenability of damp and air-dry chips are given in Table V.

TABLE V.—SCREENING OF MOIST AND AIR-DRY CHIP SAMPLES

Screen—Vibrating
Samples—Identical—{Moist—Moisture content 40.7%
{Air dry—Moisture content 8.5%

		Screen Fraction %						
Sample	Screening Period	—1¼"	—1¼" to +1"	—1" to +¾"	—¾" to +½"	—½" to +¼"	—¼" to +⅛"	—⅛"
Moist	30 sec.	1.6	9.2	28.0	31.9	23.1	5.8	0.4
Air Dry	30 sec.	1.1	6.4	26.3	32.3	25.4	7.7	0.8
Moist	1 min.	1.1	8.2	25.5	31.9	26.1	6.6	0.6
Air Dry	1 min.	0.5	6.0	24.3	32.0	27.5	8.8	0.9
Moist	2 min.	1.0	7.4	23.8	31.4	28.4	7.4	0.6
Air Dry	2 min.	0.3	5.4	22.9	31.5	28.5	10.2	1.0
Moist	4 min.	0.6	6.9	23.6	31.0	29.2	8.1	0.6
Air Dry	4 min.	0.3	5.4	22.3	30.5	29.6	10.7	1.3
Moist	6 min.	0.4	6.9	23.6	30.4	29.4	8.5	0.8
Air Dry	6 min.	0.4	5.4	21.6	30.4	30.0	10.9	1.4

These results are sufficient evidence to show that the assumption that damp chips are screened with greater difficulty than dry ones is correct. Consequently, any method for screen analysis should take into account the moisture content of the chips, at least to the extent of providing a longer screening time for damp chips. For the most accurate results the chips should be thoroughly air dried, or where time does not permit that type of drying, even a few minutes of treatment in a heated air oven would unquestionably improve the separation of the chips into the individual fractions.

Reproducibility of Results

Any procedure destined to be used to obtain analytical results should, when repeated on identical samples, give results that are similar. Further, these results should be reasonably close to known correct figures. To test out the possibility of duplication of results and to show their comparison with the correct percentage composition of the chip samples, duplicate tests were carried out on identical samples of known composition. The results are shown in Table VI.

TABLE VI.—REPRODUCIBILITY OF RESULTS OF SCREENING TESTS ON WOOD CHIPS

Screen—Vibrating
Time of screen test—4 minutes
Sample—Air-Dry Chips—Composite—Weight—2.22 pounds
% Composition—Sample 2

—1¼"	—1¼" to +1"	—1" to +¾"	—¾" to +½"	—½" to +¼"	—¼" to +⅛"	—⅛"
0.7	5.0	19.9	31.4	31.1	10.0	1.9

	Screen Fraction %						
Test	—1¼"	—1¼" to +1"	—1" to +¾"	—¾" to +½"	—½" to +¼"	—¼" to +⅛"	—⅛"
1	0.7	5.0	19.9	31.8	30.8	10.1	1.7
2	0.7	5.0	19.5	32.1	30.8	10.2	1.7

These figures show a maximum variation between duplicate determinations of 2% in the —1 to +¾-inch fraction. The greatest deviation in accuracy is in the —¾ to +½-inch fraction in which the average value is 1.75% greater than the known composition. For this type of analytical work, and particularly with chips which must go through the screen endwise and which are fragile and always likely therefore to break and thus change their size, the agreement is remarkably good.

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New England TAPPI Discusses Ink

The New England Section of the Technical Association of the Pulp and Paper Industry met at the Roger Smith Hotel, Holyoke, Massachusetts on Friday evening, April 17th. Norman I. Bearse of the Champion-International Company presided as chairman.

Black Liquor Evaporation

George Kostas of the Champion-International Company, Lawrence, Massachusetts presented a brief paper on "Engineering Studies on Pulp Liquor Evaporators." This was a report of the speaker's experience in increasing the capacity of soda mill evaporation by 20% to meet an increase in pulp production in the mill of 40%.

This study brought out the facts that existing evaporator plant capacities may be brought about in the following ways:

1. Increasing the working temperature difference.
2. Increasing the heat transfer area by means of additional units.
3. By adopting a method of feed and operation to best fit the properties of the liquor being evaporated.
4. Using heat exchangers whenever advisable.
5. By driving steam into more than one effect.
6. By reducing the final concentration of the liquor. In doing this it should be kept in mind that the purpose of evaporation is to concentrate the weak black liquor to the density required by the existing chemical recovery furnace.

Sinclair & Valentine Program

George Cramer, Director of the laboratories of the Sinclair and Valentine Company, New York, N. Y. was the next speaker and preceded his talk by showing the colored sound film "Service to the Graphic Arts," a movie which showed the operation of ink manufacture and quality control in his plant. Dr. Cramer then outlined some problems relating to lithographic printing. He indicated that the principal paper variables are smoothness, penetration and ink receptivity. There is a wide difference of ink coverage for different paper stocks of offset paper, sometimes 100%. The difference for coated papers is much less, usually not more than 25%. Some offset stocks do not seem to want to take inks. The main ink factors are strength, specific gravity, proper distribution and color. One color may be as much as ten times as strong as another. Letter press inks are usually not as strong as lithographic inks.

An enthusiastic discussion followed the presentation of both papers.

Those in Attendance

Those present included:

N. I. Bearse, Richard T. Bingham, P. S. Bolton, J. M. Booth, C. Champion, C. Child, R. J. Clapp, Walter U. Cooper, George Cramer, Paul A. Donaghy, J. K. Donohue, Mr. and Mrs. R. H. Doughty, William Foote, Raymond G. Harte, W. F. Hoffman, Charles I. Horton, William R. Hotne, L. E. Kelley, Helen U. Kiely, R. E. Kilty, A. D. King, George Kostas, W. E. Larkin, Herbert S. Leonard, R. G. Macdonald, Robert Mannheim, Milton J. Maguire, John C. Marrone, Benjamin J. Mayo, Jr., H. L. Mellen, Ernest O. Nash, P. R. Nelson, R. W. Pattison, John Phelps, R. J. Proctor, N. W. Putnam, Robert T. Sammet, George C. Schmid, F. W. Schneider, L. N. Smith, George W. Sullivan, L. B. Tucker, H. B. Van Antwerp, A. P. Wagenknecht, C. A. Weymouth and Jack F. Wright.

New Book on Pulp and Paper Microscopy

The Institute of Paper Chemistry has recently published a textbook on Pulp and Paper Microscopy by John H. Graff, who is instructing in microscopy at the Institute. Mr. Graff is known to the industry for his many articles in the technical press on fiber analysis, stains, etc., and more particularly for his Color Atlas for Fiber Identification, which was published in 1940, and whose color plates have greatly simplified fiber analysis. The new book covers the following subjects: micrometry (measure of fiber dimensions, particle size, etc.), fibers and fiber elements, fiber analysis (sampling, preparation of slides, groundwood reagents, iodine stains, Bright stain, cooking stain, bleach stain, weight factors, etc.), miscellaneous stains (sizing, textile fibers, pitch, parchment papers, silver stains, wool, etc.), speck count and speck analysis, and microtome sectioning (wood, paper, rayon, etc.). Although intended primarily for instruction at the Institute, a certain number of copies are available to the industry. It may be obtained from The Institute of Paper Chemistry, Appleton, Wis., at $5.00 per copy.

Relation of Lignin Content to the Strength of Paper and Paperboards*

III. Pulpsheets and Boards Prepared from Groundwood Delignified by Chlorine Dioxide, Sulphate, and Soda Processes

By Edwin C. Jahn [1] and C. V. Holmberg [2]

Abstract

Three series of pulps of differing lignin contents were prepared. One series was prepared by delignifying white pine groundwood by chlorine dioxide, another by cooking white pine groundwood by the sulphate process, and the third by cooking aspen groundwood with caustic soda. Pulps were also prepared by cooking in water alone. Each pulp was analyzed for lignin and pentosan content. In order to limit the effect of the variability of fiber length as much as possible, each pulp was fractionated by a Bauer classifier to segregate the different fiber lengths. The fiber fractions were then remixed in definite ratios for each series of pulps.

The pulps prepared from white pine were mixed in ratios of 1:2:3:4 for the -20, 20-35, 35-65 and 65-150 mesh fractions, respectively. For aspen pulps the ratios were 1:4:5 for 20-35, 35-65 and 65-150 mesh fractions. Standard pulpsheets and compressed fiberboards were made from these mixtures of uniform fiber distribution. Fiberboards were also made from the unfractionated white pine kraft series, employing a wide range in conditions of pressure and temperature.

For the pulpsheets there is a definite increase in strength factors, such as burst, tear, folds and breaking length with decreasing lignin. This relationship is most clear-cut in the chlorine dioxide series of pulps where the pentosan content is relatively constant and there is little or no fiber degradation. The variations in freeness are not pronounced. The density of the pulpsheets increases with delignification. Delignification results in a softer more flexible fiber.

Boards made from the kraft and soda pulps of uniform fiber distribution show increasing strength properties with decreasing lignin content until a maximum is reached at around 7-11% lignin. The greatest increase in strength for both pulp sheets and boards in all cases takes place with the removal of the first few per cent of lignin. Strength values obtained from boards made from the unfractionated pulp show no definite trends with respect to lignin content, except with the removal of the first few per cent lignin.

The lignin content of a pulp is only one of several factors which affects its physical properties. The method of treatment also markedly affects the strength and composition of the fiber and it is not possible to compare the relation of lignin content to strength between pulps prepared by different methods.

In the first paper of this series, *(4)* which was presented at the 1939 TAPPI Fall Meeting, Jahn and Holmberg discussed the broad problem of the relation of the chemical composition of fibers to papermaking properties. The literature dealing with the following topics was surveyed: (a) the composition of the cell wall in relation to its structure, (b) the effect of pulping on the structure and chemical composition of the cell wall, and (c) the relation of chemical composition to papermaking qualities. It was pointed out that the reasons why definite relationships between the chemical constituents of a fiber and its papermaking qualities have not been evaluated include the following: (a) lack of exact definition of the constituents, such as lignin, pentosans, polyuronides, etc.; (b) the very great difficulty in isolating or removing one constituent without removing or altering some of the others; (c) changes in physical factors, such as fiber dimension or freeness with removal of one or more constituents; and (d) the nonuniformity in the distribution of the constituents throughout the cell walls of the fiber. The literature indicates that the general effect of the presence of lignin in appreciable amounts results in stiff fibers which form a harsh brittle sheet with poor strength.

At this same TAPPI meeting Lewis and Richardson *(6)* presented data on the relation between delignification and strength characteristics of very raw pulps ranging in lignin content from 22.2 to 8.6%. They found that strength factors, as well as srinkage, apparent density, and porosity increased with decrease in lignin content, whereas stiffness decreased as lignin was removed. The fibers with large amounts of lignin (22.2 and 17.7%) are apparently coated with a nonswelling, nonelastic lignin layer, which is gradually removed by further delignification.

In the second paper of this series *(3)* (presented at the 1940 TAPPI Annual Meeting) data on the preparation of pulps of different lignin content by chloride dioxide was presented. It was shown that chlorine dioxide in aqueous pyridine solution furnishes a convenient method of delignification and for arresting the process at any stage for examination of the partially delignified product. This process has the advantage of less chemical action on the other constituents of the fiber and possibly less physical action on the fiber than the ordinary commercial methods.

In the present study three series of pulps of differing lignin contents were prepared. Groundwood pulp was used as the starting material in each case in order

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Commodore, New York, N. Y., Feb. 16-19, 1942.

Report on the TAPPI Fundamental Research Project at the New York State College of Forestry, Syracuse, N. Y., financially aided by a TAPPI Research Grant from the Research Promotion Committee.

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to insure uniform and easy delignification, and to avoid the necessity of having to break up raw-cooked chips mechanically. One series of pulps was prepared by delignifying white pine groundwood by chlorine dioxide, another by cooking white pine groundwood by the sulfate process, and the third by cooking aspen groundwood with caustic soda. Pulps were also prepared by cooking in water alone. Each pulp was analyzed for lignin and pentosan content. In order to limit the effect of the variability of fiber length as much as possible, each pulp was fractionated by a Bauer classifier to segregate the different fiber lengths. The fiber fractions were then remixed in definite ratios for each series of pulps as described below.

Experimental Procedure

Eastern white pine (*Pinus strobus* L.) and aspen (*Populus* sp.) groundwood pulps were used for the preparation of the different series of partially delignified pulps. These groundwood pulps were made on an experimental two-pocket grinder of the Great Northern type having a stone 32 inches in diameter with an 11-inch face.

Preparation of Pulps

Chlorine Dioxide Series. Eastern white pine groundwood pulp was freed from resins by extracting in a Sohxlet extractor with alcohol-benzene (1:2) for 6 hours. After complete evaporation of the solvent the extracted pulp was moistened with distilled water.

Delignification was carried out by the method of Schmidt, Tang, and Jandebeur *(7)*. One hundred-gram (moisture-free equivalent) portions of moist, extractive-free pulp were introduced into a black-painted carboy containing the desired amount of chlorine dioxide (Table I) in about 10 liters of solution at 5 deg. C. The calculated amount of 20% aqueous pyridine was then added. After introduction of the pyridine, the temperature was allowed to rise to that of the room (20 deg. C.) After the desired time had elapsed (Table I), the liquor was filtered off and the pulp washed with cold water until the wash water was neutral and colorless. The pulp was pressed and kept until used in airtight sealed glass jars with a few drops of toluene as preservative.

Kraft Series. Eastern white pine groundwood was digested in a cast iron rotary digester (10 inches inside diameter and 22 inches deep) heated by gas burners. Seven digestions were made using a liquor ratio of 6:1, 25% of total alkali, and a sulphidity of 3 parts of NaOH to 1 part of Na_2S as NaOH. The cooks were all heated to a maximum temperature of 165 deg. C., attained in one hour, and the amount of delignification was controlled by the total cooking time, as shown in Table I. At the end of the cooks the pressure was relieved and the pulps dumped and washed by alternately soaking and pressing out the liquor. The washed pulps were pressed and kept until used in sealed glass jars with a few drops of toluene as preservative.

Soda Aspen Series. Soda cooks were made on aspen groundwood in the rotary digester using a 6:1 liquor ratio, 20% chemical as NaOH, and a maximum temperature of 165 deg. C. attained in 1 hour. The time of cooking was varied from 1 to 4 hours to obtain the desired degree of delignification (Table I). The cooked pulp was washed and stored as described above.

Aqueous Digestions. One aqueous digestion each was performed with aspen groundwood and eastern white pine groundwood. These were carried out in the rotary digester, using 6 parts by weight of distilled water to one part of pulp. The digestions were continued for 3 hours each with a maximum temperature of 165 deg. C. The pulp was washed, pressed, and stored as described above.

Pulp Fractionation. For comparison of the different pulps it is desirable that they be as uniform as possible with respect to fiber length. To attain this uniformity the pulps were fractionated according to fiber length and a definite constant mixture of the fractions made up. The fractionation was accomplished by using a Bauer classifier to segregate 10-gram portions of the pulp into fractions of 20-mesh and larger, 20-35, 35-65 and 65-150 mesh sizes, repeating the operation until sufficient pulp for the tests had been obtained.

The pulps prepared from white pine were mixed

TABLE I.—ANALYSES OF PULPS

Experiment	Cooking or Reaction Time	Yield, %	Alcohol-Benzene soluble extractives	Lignin (% basis, cooked pulp)	Pentosans (% basis, cooked pulp)	Lignin (% basis, original material)	Pentosans (% basis, original material)	Lignin (% of original present)	Pentosans (% of original present)
			Sulphate Digestion of White Pine Groundwood						
D	0	100	1.56	27.4	12.1	27.4	12.1	100.0	100.0
D2*	120 min.	66.5	1.54	23.7	8.6	15.8	5.7	57.6	47.2
D7	105 min.	64.4	2.45	20.4	9.0	13.1	5.8	51.6	47.8
D3	120 min.	58.5	2.44	16.7	7.8	9.8	4.8	35.6	39.2
D8	140 min.	52.4	1.62	11.1	6.7	5.8	3.5	21.3	28.1
D4	3 hr.	46.6	1.43	6.5	7.2	3.0	3.4	11.2	27.7
D5	3½ hr.	48.8	1.44	4.5	6.7	2.2	3.3	8.0	26.9
D1	5 hr.	43.2	2.14	3.0	7.6	1.3	3.3	4.7	33.0
		Chlorine Dioxide Delignification of White Pine Groundwood							
H	0	100	1.56	27.4	12.1	27.4	12.1	100.0	100.0
H4	24 hrs. (0.4 g. ClO_2/g. pulp)	91.3	...	25.6	9.9	23.4	9.1	85.4	74.8
H1	12 hrs. (0.60 g. ClO_2/g. pulp)	94.2	...	17.5	8.6	16.5	8.1	60.2	67.1
H5	3 days (0.28 g. ClO_2/g. pulp)	70.8	...	7.7	10.9	5.5	7.7	20.0	63.9
H2	8 days (0.67 g. ClO_2/g. pulp)	71.2	...	1.7	9.1	0.8	6.5	2.8	53.6
		Soda Cooking of Aspen Groundwood							
K	0	100	0.72	20.0	20.0	20.0	20.0	100.0	100.0
K4	1 hr.	73.0	0.61	15.0	15.4	11.0	11.2	56.2	48.1
K3	2 hr.	64.7	0.60	8.9	15.9	5.7	10.3	28.3	43.9
K2	3 hr.	58.7	0.60	6.6	17.7	3.9	10.4	19.5	44.3
K1	4 hr.	51.7	0.60	1.8	9.1	0.9	4.7	4.7	23.4
		Aqueous Digestion of White Pine Groundwood							
L2	3 hr.	74.0	2.74	31.7	5.74	23.5	4.26	85.7	35.2
		Aqueous Digestion of Aspen Groundwood							
L1	3 hr.	76.3	7.40	18.2	6.08	14.3	4.58	71.4	22.9

* Max. Temp. = 155°. All others 165° C.

in ratios of 1:2 : 3 : 4 for the 20, 20-35, 35-65 and 65-150 mesh fractions, respectively. For aspen pulps the ratios were 1: 4 : 5 for the 20-35, 35-36 and 65-150 mesh fractions. Standard pulpsheets and compressed fiber boards were made from these mixtures of uniform fiber distribution.

Board and Sheet Formation and Testing

Compressed fiberboard disks 4 square inches in area were made in a cylindrical plunger-type mold, the base of which was drilled with 1/16 inch holes and grooved on the lower side to permit rapid egress for the water. A Carver laboratory hydraulic press with a total capacity of 30,000 pounds and a lage hydraulic press having a capacity of 125 tons were used to obtain the desired pressures. Both presses are equipped with upper and lower heating platens that could be regulated to the desired temperature by rheostats. An additional external coil heater was sometimes placed around the mold to obtain temperatures higher than obtainable with the press platens alone. The temperature of the mold was determined by a right angle thermometer inserted into a well drilled in the body of the mold.

Pulp for boards was first extracted with alcohol and then alcohol-benzene (1:2), and finally the alcohol-benzene was replaced by washing with alcohol and finally with water, care being taken to avoid drying the fibers during these treatments. The desired amount of wet pulp (about 9 grams moisture-free basis) was weighed into a beaker and stirred for 5 minutes in 400 cc. of water with a laboratory stirrer to break all lumps. The pulp suspension was then poured into the body of the mold, which had been placed over a fine wire screen to permit drainage of the water. After the bulk of the water had drained off, the plunger was inserted and the mold base, backed by two fine wire screens and two felts was placed in position. The assembled mold containing the pulp was placed in the press and the pressure gradually raised to the desired amount. This pressure was maintained for about 20 minutes to allow the greater portion of the water to drain, after which the mold was removed from the press, unassembled, and the parts wiped dry. The pulp disk was reinserted, the mold reassembled, replaced in the press and the pressure brought to the desired amount. The temperature of the mold was then gradually raised to the desired figure, care being taken to remove all of the steam before going above 110 deg. C., in order to prevent formation of blisters or pockets. After the desired heat treatment, the mold was allowed to cool to 100 deg. C. before the pressure was released. The pulp board was allowed to condition several days in the testing room before it was tested.

The fiberboards were tested for strength in static bending by the method described by Jahn, Larson, and McCarthy *(5)*. Two test strips, about 3/8 inch wide, were cut from each disk for testing. The span of the test strips between the supports was 1.859 inches.

Pulpsheets were formed and tested by the methods described in TAPPI Standards T 205 m-40 *(9)*.

Chemical Analyses

Lignin was determined by treating samples for 16 hours at 10 deg. C. with 70% sulphuric acid according to the method of Sherrard and Harris *(8)*. Pentosans were determined by the Tollens method, the furfural being precipitated with phloroglucinol *(2)*.

Discussion of Results

Strength of Pulpsheets

The strength of pulpsheets increases with decreased lignin content (Figs. 1, 2, 3 and Tables II, III, and IV). In the chlorine dioxide white pine pulp series (Fig. 1, Table II) there is a rapid and fairly regular

TABLE II.—STRENGTH OF PULPSHEETS
(Chlorine Dioxide Series on White Pine, Uniform Fiber Distribution)

Number	Lignin Pentosans		Freeness, cc. (corr. to 20° C., 0.3 g. per l.)	Density	Burst Factor	Tear Factor	Double Folds (Schopper)	Breaking Length, meters	Stretch, %
	% of Pulp	% of Pulp							
H (original)	27.4	12.1	404	0.424	3.9	28.7	0	706	0.4
H4	25.6	9.9	529	0.326	14.8	46.7	2.9	2050	1.1
H1	17.5	8.6	393	0.433	21.5	54.4	32.1	3595	1.2
H5	7.7	10.9	385	0.534	39.0	51.7	735	7190	1.5
H2	1.1	9.1	232	0.730	73.2	70.2	5430	10,900	2.4

TABLE III.—STRENGTH OF PULPSHEETS
(Kraft Series on White Pine, Uniform Fiber Distribution)

Number	Lignin Pentosans		Freeness, cc. (corr. to 20° C., 0.3 g. per l.)	Density	Burst Factor	Tear Factor	Double Folds (Schopper)	Breaking Length, meters	Stretch, %
	% of Pulp	% of Pulp							
D (original)	27.4	12.1	404	0.424	3.9	28.7	0	706	0.4
D2	23.7	8.6	484	0.382	6.0	45.0	1.7	1290	1.0
D7	20.4	9.0	494	0.380	7.7	46.7	2.2	1270	0.6
D3	16.7	7.8	534	0.442	6.1	56.0	1.7	1345	1.1
D8	11.1	6.7	472	0.436	10.6	55.5	6.0	1864	0.5
D4	6.5	7.2	498	0.444	12.6	62.8	13.9	1830	1.2
D5	4.5	6.7	422	0.500	10.7	67.7	9.0	2015	1.4
D1	3.0	7.6	504	0.365	8.0	76.6	2.36	1220	1.1
Aqueous Digested White Pine									
L2	31.7	5.74	565	0.292	3.7	27.1	0	542	0.6

TABLE IV.—STRENGTH OF PULPSHEETS
(Soda Series on Aspen, Uniform Fiber Distribution)

Number	Lignin Pentosans		Freeness, cc. (corr. to 20° C., 0.3 g. per l.)	Density	Burst Factor	Tear Factor	Double Folds (Schopper)	Breaking Length, meters	Stretch, %
	% of Pulp	% of Pulp							
K (original)	19.99	20.0	523	0.269	5.4	19.8	0	817	0.6
K4	15.0	15.4	507	0.413	6.8	35.2	1.8	1451	1.1
K3	8.9	15.9	522	0.452	5.8	38.2	2.0	1150	1.1
K2	6.6	17.7	461	0.422	7.0	33.1	2.5	1440	1.2
K1	1.8	9.1	406	0.460	10.1	45.5	5.3	1900	1.2
Aqueous Digested Aspen									
L1	18.2	6.1	583	0.338	2.7	16.4	0	445	0.5

increase in bursting, tensile, and tearing strengths, with removal of lignin from the original content of 27.4% down to 1.1%. The number of double folds increases slowly with removal of initial amounts of lignin, but rises rapidly with the later stages of delignification. The density of the sheet increases as the lignin is removed. All these changes indicate that as lignin is removed from the groundwood by chlorine dioxide, the fibers adhere to each other more tenaciously, forming a more strongly knit as well as a more flexible sheet.

These same general trends hold in the kraft white pine series, (Fig. 2, Table III) with the exception that bursting, tensile, and folding strengths reach a maximum at about 6.5% lignin and rapidly drop with removal of the remaining lignin. This final drop in strength probably has no relation to lignin content, but is likely due to degradation of the cellulose (secondary wall) of the fibers by the long time that (3-5 hours) they were subjected to sulphate digestion at maximum temperature. In the soda aspen series (Fig. 3, Table IV), in which the fiber was cooked with a lower concentration of alkali and the maximum length of time was not as great, there is no falling off in strength with the final stages of lignin removal. This reasoning is supported by microchemical observations which will be described in Part IV, following this paper.

The increase in strength with delignification is slower in the soda aspen series than with either of the white pine series. The strength values for the pulps digested in water are included on each of the figures (symbols in large circles). White pine groundwood cooked in water has a greater lignin content than the original pulp, due primarily to loss of pentosans and perhaps some cellulose degradation. It will be noticed that the strength values for water digested pulp fall in line on the delignification curves of the chlorine dioxide pulp series, and are not very far off in the kraft series. Hardwoods behave differently than the softwoods and appreciable lignin is dissolved from aspen by aqueous digestion, which agrees with the findings of Aronovsky and Gortner *(1)*. About 70% of the total pentosans in the aspen

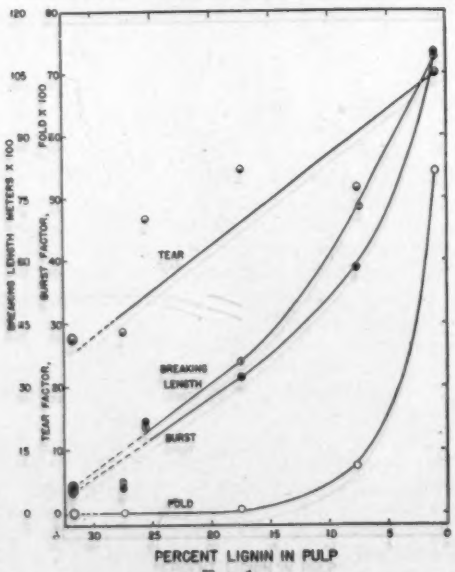

FIG. 1

Strength of Chlorine Dioxide Pulpsheets. Uniform Fiber Distribution

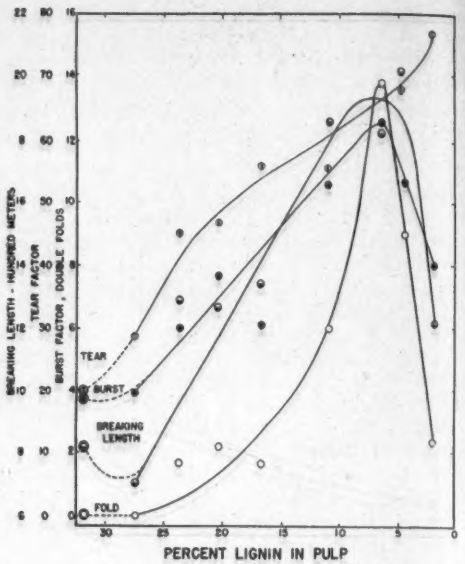

FIG. 2

Strength of Kraft, White Pine Pulpsheets. Uniform Fiber Distribution

are also removed and possibly there is some cellulose degradation. These fundamental alterations in fiber composition result in the formation of pulpsheets which are weaker despite their lower lignin content than those made from the original groundwood.

Examination of the figures for density and freeness shows a fundamental difference between the chlorine dioxide pulp series as compared to the sulfate and soda pulp series. In the chlorine dioxide series (Table II) there is a marked increase in density and decrease in freeness with the removal of the last 8-10% of lignin despite the maintainance of uniform fiber size distribution. The fold curve (Fig. 1) rather closely follows this abrupt increase in density as would be expected. The other strength factors (burst, breaking length, and tear), however, show much less relation to density and freeness. For example there is a tremendous increase in strength between 17.5 and 7.7% lignin but a change in freeness of only 8 cc. Chlorine dioxide appears to soften

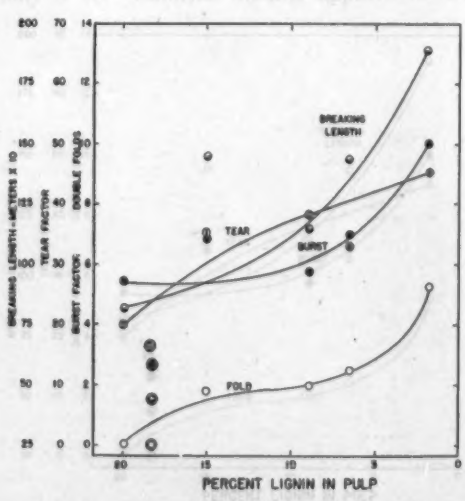

FIG. 3

Strength of Aspen Soda Pulpsheets. Uniform Fiber Distribution

TABLE V.—STRENGTH OF BOARDS MADE FROM KRAFT PULPS OF DIFFERENT LIGNIN CONTENTS AND PRESSED AT VARIOUS TEMPERATURES AND PRESSURES

(Not Fractionated to Uniform Fiber Distribution)

Lignin % of Pulp	Pentosans % of Pulp	Pressure, p.s.i.	Temperature, deg. C.	Modulus of Elasticity, 1000 p.s.i.	Modulus of Rupture, p.s.i.	Stress at Elastic Limit, p.s.i.	Shear Stress, p.s.i.
27.4	12.1	4000	150	766	8422	6284	212
		1000	150	977	11600	7921	302
		400	150	801	7519	5243	244
		250	185	732	6970	4707	210
		250	150	1052	9840	6403	326
		250	110	734	7864	5062	243
		100	150	574	5539	4302	185
23.7	8.6	4000	150	1020	13635	7420	351
		1000	150	1254	15410	8686	405
		400	150	1378	17480	8569	420
		250	185	1287	13120	7399	369
		250	150	1074	13825	8923	402
		250	110	756	11107	7255	288
		100	150	1150	13400	7733	377
20.9	9.0	4000	150	1052	9098	7146	283
		1000	150	1276	13315	8272	393
		400	150	1310	12850	8467	367
		250	185	1041	9664	6919	321
		250	150	1346	13195	7011	425
		250	110	913	10106	6152	266
		100	150	1066	11075	7000	362
16.7	7.8	4000	150	1070	15975	7813	413
		1000	150	793	17650	7503	306
		400	150	1221	13060	7745	327
		250	185	1344	13800	7880	371
		250	150	1065	12765	7747	335
		250	110	1062	12760	7918	322
		100	150	963	11810	7622	320
11.1	6.7	4000	150	1094	9381	5975	249
		1000	150	1277	10760	7621	317
		400	150	1101	9718	7082	306
		250	185	1067	10253	6609	342
		250	150	1098	10745	7139	322
		250	110	955	9130	6735	279
		100	150	773	6609	4480	201
6.5	7.2	4000	150	801	14010	6902	376
		1000	150	785	12265	6603	305
		400	150	1165	15770	7473	403
		250	185	1160	13820	7401	361
		250	150	1161	15525	7442	385
		250	110	815	9946	6839	316
		100	150	1328	12405	7398	375
4.5	6.7	4000	150	946	12180	5986	317
		1000	150	920	13340	5617	342
		400	150	950	11920	6114	326
		250	185	1113	13095	6782	366
		250	150	1074	14100	7983	381
		250	110	898	11380	6544	299
		100	150	942	13385	6900	377
3.0	7.6	4000	150	1015	15145	8204	392
		1000	150	928	13160	8438	303
		400	150	1140	13725	6858	363
		250	185	1031	12090	6966	329
		250	150	1125	11675	6985	332
		250	110	978	11605	7895	306

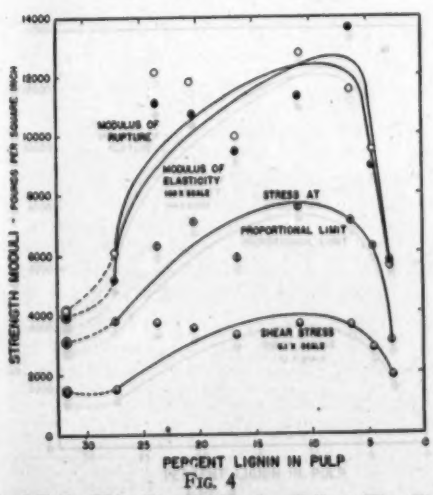

FIG. 4

Strength of Kraft, White Pine Pulpboards. Uniform Fiber Distribution. Pressed at 250 p.s.i. at 150 Deg. C.

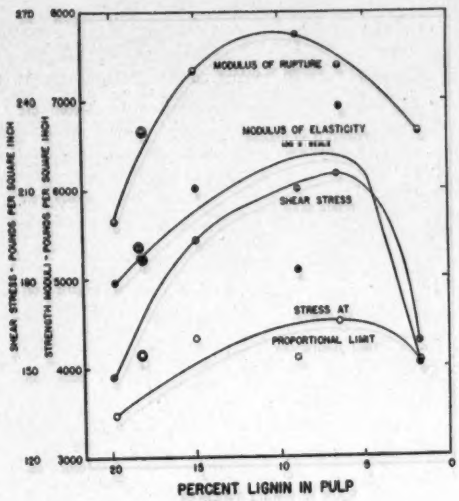
SHEAR STRESS - POUNDS PER SQUARE INCH
STRENGTH MODULI - POUNDS PER SQUARE INCH
MODULUS OF RUPTURE
MODULUS OF ELASTICITY
SHEAR STRESS
STRESS AT PROPORTIONAL LIMIT
PERCENT LIGNIN IN PULP

FIG. 5

Strength of Aspen, Soda Pulpboards. Uniform Fiber Distribution. Pressed at 250 p.s.i. at 150 Deg. C.

greatly the fiber at the lower lignin contents, decreasing the porosity of the sheet and increasing its density.

In the sulphate and soda pulp series there is no uniform trend in either density or freeness and these properties remain fairly constant with delignification. This indicates stiffer fibers and more porous sheets than is the case with the chlorine dioxide treated fibers at the lower lignin levels. Furthermore, because the density and freeness variables show no definite trend in the sulphate and soda series, and, since fiber length is controlled, it can be concluded that the strength fatcors shown are mostly a function of the chemical composition of the sheet.

Strength of Pressed Boards

Two factors enter into the formation of the test boards as compared with pulpsheets and these might be expected to affect the nature of the bonding of the fibers. These are pressure and temperature. However, variation of the pressure from 100 to 4000 p.s.i. at a constant temperature of 150 deg. C. and variation of the temperature of board formation from 110 to 185 deg. C. at a constant pressure of 250 p.s.i., showed only small trends in the groundwood and kraft pulps of different lignin contents (Table V). In most cases the boards made at the lower pressures are slightly weaker, the greatest strength being shown on the average in boards pressed at about 1000 p.s.i. Boards pressed at 150 deg. C. showed greater strength in most cases than those pressed at 110 or 185 deg. C. All of the boards in the series compressed at different pressures and temperatures were made from kraft pulps which were not fractionated to obtain uniform fiber distribution. It is interesting to note that there is no significant trend in strength with respect to lignin content, except between the original groundwood and the mildest cooked kraft pulp.

However, test fiber boards made from pulps which had been fractionated and brought to uniform fiber distribution show a relationship between lignin content and strength. In both the kraft white pine series (Fig. 4, Table VI) and the soda aspen series (Fig. 5, Table VII) there is an increase in strength and stiffness in static bending with decreased lignin content

until a maximum is reached with fibers containing 7-10% lignin.

The strength then decreases with removal of the remaining lignin under the conditions employed. This final drop in strength is similar to that observed in the pulpsheets made from the kraft white pine pulps and the same explanation seems most plausible—i.e., that degradation of the cellulose in the secondary walls results in weaker fibers. However, such a drop in strength was not observed in the pulpsheets made from the soda aspen pulps (which were prepared under somewhat milder conditions than the kraft pulps).

Apparently the weakening of the soda aspen fibers cooked for the longest time period was not sufficiently great to affect the strength of the pulpsheets, but showed up when the fibers are subjected to a temperature of 150 deg. C. under high pressure.

It is apparent that the presence of lignin, at least in amounts over 10%, decreases the bonding forces between the fibers of boards made from wet stock and prepared by drying and heating under pressure. This conclusion is substantiated by microchemical observations (Part IV).

An interesting fact is that the initial removal of lignin from groundwood pulp, whether by chlorine dioxide or mild alkaline digestion, results in a great increase in strength of both sheets and boards, which is not in proportion to the relatively small difference in lignin content. There is also a large initial loss in pentosans (Table I) with the first mild delignification. Whether or not there is any relation between these facts is not ascertained. Although there is only about 4% less lignin in the 120-minute cooked kraft white pine than in the original groundwood, 43% of the original lignin has actually been removed from the wood (Table I). The pulp treated 24 hours with chlorine dioxide has only about 2% less lignin than the groundwood, yet 15% of the original lignin has been dissolved. It is possible, therefore, that the nature of the residual lignin fraction differs from that in the original fiber. Furthermore, the general character of the composition of the fiber probably alters to some degree.

Conclusions

Control of the fiber length variable in a series of partially delignified pulps permits a more accurate determination of the effect of chemical composition on the strength properties of sheets and boards made from these pulps. The strength of pulpsheets (burst, breaking length, tear, and folds) and of boards (strength in static bending) increases as the lignin content of the fiber decreases.

As the lignin is removed from groundwood, the fibers adhere to each other more tenaciously forming a more strongly knit sheet or board.

Removal of the last 8-10% of lignin by chlorine dioxide results in a softer fiber giving lower freeness and greater density. Delignification by soda or sulphate cooking has much less effect on freeness or density, provided the pulps are brought to uniform fiber length distribution, indicating that these pulps have stiffer fibers than the chlorine dioxide pulps.

Variation of the heat and pressure of formation of boards from wet stock has comparatively little effect on their final strength. This is true regardless of the lignin content of the pulp.

The application of heat (up to 185 deg. C.) and pressure in the formation of fiberboards from wet stock causes no apparent lignin bonding. On the contrary there is a rapid increase in bonding strength in fiberboards as lignin is removed, at least until there is only 7-10% remaining in the fiber.

The method of delignification also affects the strength and composition of a fiber. It is not possible to compare the relation of lignin content to strength between pulps prepared by different methods.

TABLE VI—STRENGTH OF BOARDS
(Kraft White Pine Series, Uniform Fiber Distribution)

Number	Lignin % of Pulp	Pentosans % of Pulp	Freeness, cc. (corr. to 20° C., 0.3 g. per l.)	Modulus of Elasticity 1000 p.s.i.	Modulus of Rupture, p.s.i.	Stress at Elastic Limit, p.s.i.	Shear Stress, p.s.i.
D (original)	27.4	12.1	404	520	6084	3809	151
D2	23.7	8.6	484	1110	12125	6273	375
D7	20.4	9.0	494	1073	11795	7075	354
D3	16.7	7.8	534	942	9974	5875	330
D8	11.1	6.7	472	1125	12780	7595	366
D4	6.5	7.2	498	1261	11490	7069	359
D5	4.5	6.7	422	896	9447	6105	281
D1	3.0	7.6	504	575	5629	2980	195
			Aqueous Digested White Pine				
L2	31.7	5.7	565	395	4129	3131	145

TABLE VII.—STRENGTH OF BOARDS
(Soda Aspen Series, Uniform Fiber Distribution)

Number	Lignin % of Pulp	Pentosans % of Pulp	Freeness, cc. (corr. to 20° C., 0.3 g. per l.)	Modulus of Elasticity, 1000 p.s.i.	Modulus of Rupture, p.s.i.	Stress at Elastic Limit, p.s.i.	Shear Stress, p.s.i.
K (original)	19.9	20.0	523	497	5652	3443	147
K4	15.0	15.4	507	602	7342	4332	193
K3	8.9	15.9	522	509	7731	4131	211
K2	6.6	17.7	461	693	7378	4513	216
K1	1.8	9.1	406	405	6670	4090	159
			Aqueous Digested Aspen				
L1	18.2	6.1	583	523	6676	4162	191

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Powell River Plans Chipping Plant

The Powell River Company, Powell River and Vancouver, B. C. plan the establishment of a "chipping" plant in Queensborough district.

The council granted a ninety day option on 10.5 acres near the Westminster Shook Mill and adjoining the Richmond Municipal boundary. The proposed site is in the north arm of the Fraser river.

The cost of the proposed plant was not disclosed but it is expected to employ about forty persons.

The site is assessed at $1325 but this is on an agricultural land basis and the company will be informed that it automatically increases when the land becomes industrial.

In recent years mills have been established in this area cutting hemlock lumber and the Powell company's move is to use the waste from these mills for paper making purposes.

Standardization Activities

"Standardization Activities of National Technical and Trade Organizations" is the title of a new publication (Miscellaneous M169) which has just been released by the National Bureau of Standards.

This volume, which was cimpiled by Robert A. Martino of the Bureau's Codes and Specifications Division, presents what is believed to be a fairly adequate picture of the standardization and simplification movement as now carried on by national technical and trade organizations in the United States. It outlines the activities and accomplishments of 450 American societies and associations which consider standardization as one of their important activities, and devotes special attention to the cooperation of these groups among themselves, and with such general standardizing agencies as the American Standards Association, American Society for Testing Materials, Central Committee on Lumber Standards, and the National Aircraft Standards Committee.

During the present emergency, the information given in this publication should be particularly valuable as it makes available to each group a clear picture of what others are doing, thus helping to avoid duplication. It provides the answers to many urgent inquiries received by the Bureau from manufacturers, industrial experts, engineers, and purchasing agents, and thus should be a means of furthering the defense program.

The various organizations are arranged alphabetically, and the name and address of the secretary or other official to whom inquiries should be sent are given in all cases. A "Bibliography on Standardization" compiled by Anne L. Baden, of the Library of Congress, and a comprehensive index are valuable features.

Copies of M169, bound in buckram, are obtainable from the Superintendent of Documents, Government Printing Office, Washington, D. C. Price is 75 cents.

Synthetic Rubber Sponge

A four-page catalog section on its recently announced synthetic rubber sponge, made from its Ameripol synthetic rubber, developed in its own laboratories, has just been published by The B. F. Goodrich Company, Akron, Ohio and is now available upon request.

The catalog section points out that the new product has all the essential characteristics of natural sponge rubber and in many respects is far superior. Properties are described and dimensions given for stock sizes of available slabs, tubing, cord and molded shapes.

Ameripol sponge, the company advises, is controlled by the same Governmental restrictions that apply to natural rubber.

One of the most interesting parts of the catalog section is a table comparing the property relation of the new synthetic rubber and the natural rubber sponge.

Progress on Powell River Sulphite Mill

Work is in progress on the erection of a new sulphite plant for the Powell River Company but some delays of an unavoidable nature due to war conditions have interrupted construction schedule. It is expected, however, that the plant will be completed some time during the present summer months.

New Literature

Roof ventilators for industrial and commercial buildings, is the subject of Bulletin 214 and 215, issued by the Swartwout Co., 18511 Euclid avenue, Cleveland, Ohio. The former describes the company's line and the latter publication is a guide for estimating ventilation and roof ventilator requirements, including instructions for installation on various standard and special forms of roofs.

Iron cement for patching concrete floors, is described in a booklet issued by the Smooth-On Manufacturing Company, 570 Communipaw avenue, Jersey City, N. J. It describes the company's quick hardening iron base cement, which is wear resistant, dustproof, oil and waterproof.

Smoke density recorders, are described in Catalogue N-93-163, replacing Catalog N-93, issued by the Leeds & Northrup Co., 4907 Stenton avenue, Philadelphia, Pa. It covers the company's Micromax instruments, by which the smoke trend is recorded by means of a black pointer on a large dial, the smoke density being continuously recorded in red ink. Full size reproductions of indicating scales are included.

To Survey N. E. Scrap Industry

BOSTON, Mass., April 20, 1942—Forty representatives of the Office of Price Administration will survey the New England scrap industry, beginning April 27, it was announced in Washington April 14. Spot checks of peddlers, collectors, dealers and brokers will be made during the month-long inquiry, it was said. Information will be sought on all types of scrap material, including waste paper. It was expected that New England would evince many characteristics common to other scrap producing regions.

Government Paper Bids

WASHINGTON, D. C., April 22, 1942—The Government Printing Office has received the following bids for 25,000 pounds of 26 x 38 chipboard; Old Dominion Paper Company, 2.718 cents; Continental Paper Company, 2.625 cents; Mudge Paper Company, 2.73 cents; Virginia Paper Company, 2.75 cents; George W. Millar & Company, Inc., 2.75 cents; Stanford Paper Company, 2.7245 cents; R. P. Andrews Paper Company, 2.73 cents; and Whitaker Paper Company, 2.66 cents.

New Raybestos-Manhattan Directors

J. H. Mathews and O. H. Cilley were elected to the board of directors of Raybestos-Manhattan, Inc. at a recent meeting of Stockholders in New York. Mr. Matthews is assistant general manager of The Manhattan Rubber Manufacturing Division, Passaic, N. J., and Mr. Cilley is assistant general manager of the United States Asbestos Division, Manheim, Pa., both prominent Divisions of Raybestos-Manhattan.

New Goodrich Belts Now in Stock

Announcement is made by The B. F. Goodrich Company, Akron, Ohio, which a short time ago introduced new lines of static-discharging and oil-resistant V-belts, that these lines are now being carried in stock in all popular sizes of A, B and C cross-sections. Previously the belts had been made only on special orders.

New York Paper and Pulp Market Review

OPA Fixes Maximum Wood Pulp Prices — Overall Price Level On Chemical Pulp Unchanged, With Groundwood Higher—New Amendment On Java Sisal Cordage and Twine—Paper Stock Soft.

Office of the PAPER TRADE JOURNAL
Wednesday, April 22, 1942.

A decline in activity in the wholesale paper market is indicated in reports received this week from many manufacturers' representatives, jobbers, and general paper merchants. War requirements, which have made priorities necessary, conscripted employees and steadily decreasing civilian demand for various grades of paper, are mentioned in current reports. The decrease in volume of paper for civilian use is attributed in part to government restrictions to further the production of military goods, and to the paper conservation program. A further decline is indicated in the market trend on some grades of paper.

The index of general business activity for the week ended April 11 declined to 132.5%, from 136.0% for the preceding week, compared with 120.6% for the corresponding week last year. Paper board production declined 15.1%.

Paper production for the week ended April 11 was estimated at 99.4%, compared with 95.0% for 1941, with 81.8% for 1940, with 81.0% for 1939, and with 68.0% for the corresponding week for 1938.

Paper board production for the week ended April 11 was 93.0%, compared with 84.0% for 1941, with 66.0% for 1940, with 69.0% for 1939, and with 68.0% for the corresponding week for 1938.

The heavy demand for multi-wall paper sacks, now extensively being substituted for jute and other bagging material, is being met by increasing production of this grade of kraft paper. Stocks of kraft wrapping and bag paper are reported adequate for all uses at this date.

The new advisory committee appointed by the War Production Board is reported holding closed meetings in furtherance of the standardization and simplification program. No definite official announcements in reference to changes in paper sizes and weights, has yet been made.

Prices on all grades of paper are unchanged at this date.

Wood Pulp

The new OPA maximum prices on wood pulp became effective April 20. The overall price level of chemical pulp is the same as that which has prevailed under the voluntary agreements. Groundwood pulp, however, has been increased to $46 per ton. The full text of the regulation is covered in "Maximum Price Regulation No. 114—Wood Pulp," issued by the Office of Price Administration on April 16. This price schedule covers domestic producers only. It is reported in some quarters that while some Canadian mills may follow OPA prices, others may possibly issue their own delivered quotations soon.

Rags

Roofing rags are reported active at this date. New cotton cuttings are in steady demand. Prices are firm and unchanged on all grades of new and old rags.

Old Rope and Bagging

Mill buying of old No. 1 Manila rope continues steady. Trading in scrap bagging is reported good at this date. No important change in prices has been reported this week.

Old Waste Paper

Salvage drives for the conservation of paper have resulted in an oversupply at this date of the lower grades in poor packings. The Bureau of Industrial Conservation, Lessing J. Rosenwald, chief, urges mills to increase their stocks and packers to use better packing methods to enable mills to increase their inventories.

Twine

The War Production Board has amended the Agave Fiber Order M-84. The use of Agave sisalana (Java sisal), for the manufacture of wrapping or binder twine, is now prohibited. Inventory restriction on imports of wrapping twine are lifted on Agave cordage and twine. The amendment permits free importation of wrapping twine. Sale restrictions are unchanged. Users of wrapping twine are permitted more flexibility in their inventories.

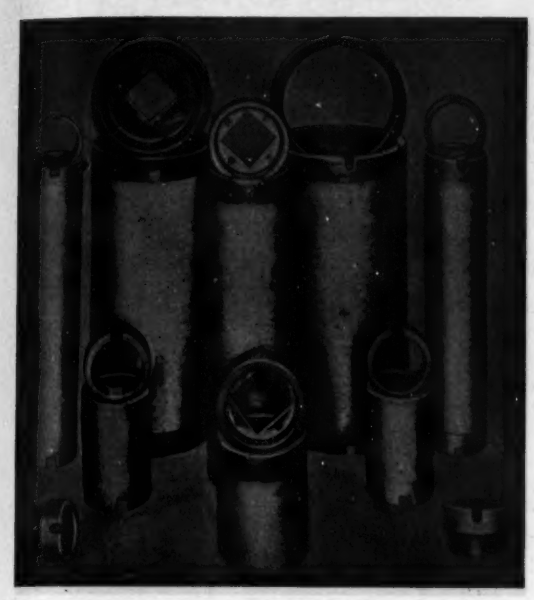
Lake States TAPPI Meets

The Lake States Section of the Technical Association of the Pulp and Paper Industry met at the Conway Hotel, Appleton, Wis., on Tuesday, April 14th.

There were two interesting papers presented, namely, "Mullen Tester Gauge Errors" by Milton G. Schmitt, Thilmany Pulp & Paper Co., Kaukauna, Wis., and "Use of Dolomite Lime in the Preparation of Bleach Liquor" by Martin Van De Laarschot, Hoberg Paper Mills, Green Bay, Wis. A $25.000 Defense Bond was awarded to Mr. Schmitt by the judges for the best paper presented.

Those present included:

L. H. Andrews, E. G. Artz, Joe Atchison, Arnold Beaman, Gilbert H. Benz, W. L. Cassiday, H. C. Crane, Martin H. Van De Laarschot, H. P. Dixson, S. Ekman, G. F. Enderlein, George B. Estey, J. R. Fansclow, L. E. Fitzgerald, J. W. Grimes, John A. Handeyside, John M. Hayes, Walter J. Higbie, E. C. Jacobi, W. A. Johnson, Charles Koon, Otto Kuemmerling, G. T. Latham, A. Lewenstein, N. L. Malcove, O. Mead, Jr., Carl Moe, Carl Nystrom, A. Olejneczak, L. S. Oyster, T. A. Pascoe, L. B. Penhallow, M. W. Phelps, A. Phillips, William J. Plank, D. C. Porter, T. R. Probst, John C. Redd, T. J. Russell, R. W. Sullivan, Fred W. Sanders, C. A. Schroeder, Milton G. Schmitt, Ed. Schoenberger, Howard Sheldon, A. I. Sippola, R. A. Stillings, E. R. Sutherland, W. H. Swanson, Adolph A. Thompson, Ed. Timmerman, Lambert Van Roy, H. L. Voss, S. D. Wells, John P. Weidner, Clarence J. West, Jr., Charles S. Wilson, Jr., and J. A. Wollwage.



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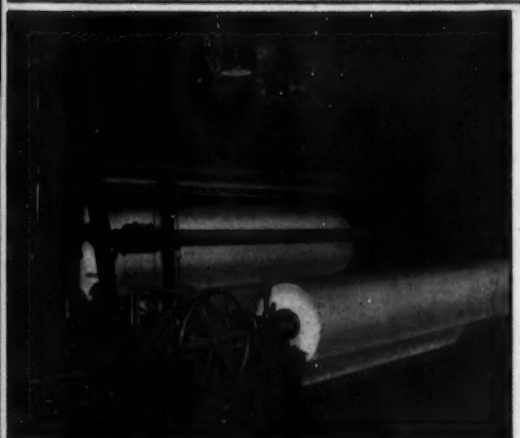

Cameron Mill-Type Web Tension Control insures uniform density of rewound rolls and fewer web breaks. Water-cooled friction device prevents overheating at high speeds.

"In comparison with the manual control of tension, we have found that your Constant Tension Unwind Stands give more evenly wound rolls; all rolls wound the same, as the tension is always the same, whereas with manual control it depends on the man operating the winder; less winder breaks; and better starts at the core."

Thus the St. Croix Paper Company, Woodland, Maine, well expresses some of the outstanding features of CAMACHINE Constant Tension Unwind Stands. Additional data about these machines are available in an interesting folder, with detailed illustrations and drawings, which are available on request.

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CAMACHINE

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL
Wednesday, April 22, 1942.

BLANC FIXE—Quotations on blanc fixe are firm and continue unchanged at prevailing market levels. The pulp is currently quoted at $40 per ton in barrels, at works; the powder is offered at $60 per ton, f.o.b., works.

BLEACHING POWDER—Prices on bleaching powder are firm. Demand reported good for the week. Bleaching powder is currently quoted at $2.25 per 100 pounds, in drums, at works.

CASEIN—Quotations on casein are unchanged for the week. Standard domestic casein, 20-30 mesh, is currently quoted at 21 cents per pound; 80-100 mesh at 21½ cents per pound; all prices in bags, car lots. Standard Argentina casein is currently offered at 17 cents per pound. No quotations on French casein.

CAUSTIC SODA—Prices on caustic soda are reported firm. Demand heavy for the current week. Solid caustic soda is currently quoted at $2.30 per 100 pounds, flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay at from $12 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Quotations on chlorine unchanged. Market under Government regulation. Supply situation tight. Chlorine is currently quoted at from $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—Quotations on some grades of rosin are lower for the current week. "G" gum rosin is currently quoted at $2.83 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $2.78 per 100 pounds in barrels, New York. Seventy per cent gum rosin size is quoted at $3.22 per 100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm. Demand good for the current week. Domestic salt cake is currently quoted at $15 per ton in bulk; chrome salt cake at $16 per ton. All prices in car lots, f.o.b., shipping point. Quotations on imported salt cake are nominal at $16 per ton.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market quotations. Demand reported good. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch continue unchanged for the current week. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds; all prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Demand reported good. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at from $1.75 to $1.85 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices of sulphur are firm and continue to conform to prevailing market quotations. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $18 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, at mills. No quotations on imported talc.

MARKET QUOTATIONS

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone 4			
Northern, Extra Quality	$6.00	@	$7.00
Superstandard	5.25	"	6.25
Northern Standard Wrapping	4.75	"	5.25
Standard Wrapping	4.75	"	—
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.05	"	—
White No. 1½	1.00	"	—
White No. 2	1.00	"	—
Anti-Tarnish M. G.	.95	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.35	"	—
Bleached, Jr.	2.65	"	—
Manila—per cwt.—C. l. t. a.			
No. 1 Jute	8.75	@	10.75
No. 1 Manila Wrapping, 35 lb.	5.50	"	5.75
No. 3 Manila Wrapping, 35 lb.	5.25	"	5.50
Boards, per ton—			
News	*48.00	@	—
Chip	*45.00	"	—
Sgl. Mla. Ll. Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*60.00	"	—
Binders Boards	84.90	"	116.00

*OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds			Ledgers	
100% Rag Ext. No. 1	$40.25	@	$47.25	$41.40	@ $48.50
100% Rag	32.20	"	37.75	33.35	" 39.25
85% Rag	....	"	....	32.20	" 37.75
75% Rag	24.75	"	29.00	25.90	" 30.50
65% Rag	....	"	....	22.80	" 27.75
50% Rag	18.70	"	22.75	19.90	" 24.25
25% Rag	16.40	"	20.00	17.55	" 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds			Ledgers	
No. 1	$10.55	@	$12.75	$11.70	@ $14.25
No. 2	9.65	"	11.75	10.80	" 13.25
No. 3	9.20	"	11.25	10.35	" 12.50
No. 4	8.90	"	10.75	10.05	" 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper.

Delivered in Zone 1:

No. 1 Glossy Coated	$13.65	@	$15.50
No. 2 Glossy Coated	12.40	"	14.00
No. 3 Glossy Coated	11.60	"	13.25
No. 4 Glossy Coated	11.15	"	12.75
No. 1 Antique (watermarked)	10.25	"	11.75
No. 2 Offset	9.60	"	11.00
A Grade E. F.	9.35	"	10.75
A Grade S. & S. C.	9.60	"	11.00
B Grade E. F.	8.85	"	10.25
B Grade S. & S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.75
C Grade S. & S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.50
D Grade S. & S. C.	8.50	"	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices

Bl. Softwood Sulphite	$76.00
Unbl. Softwood Sulphite	66.00
Bl. Hardwood Sulphite	73.50
Unbl. Hardwood Sulphite	63.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich	72.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	82.00
S. Semi-Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	66.00
Unbl. Soda	62.00
Groundwood	46.00

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	$11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum price.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	8.00	@	8.25
Silesias No. 1	4.50	"	4.75
New Unbleached	8.00	"	8.25
Blue Overall	5.75	"	6.00
Fancy	3.00	"	3.25
Washables	2.50	"	2.75
Mixed Khaki Cuttings	2.50	"	2.75
O. D. Khaki Cuttings	3.00	"	3.25

Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
* Old Manila Rope	5.75	"	—

*OPA Maximum Prices.

Foreign Rags

All prices nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	@	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40

TENSILASTIC
... RUBBER ROLLS ...

We rubber cover and rubber line tanks. We also rubber cover propellers, machine parts and other products requiring protection against acids, fumes and other unfavorable elements. Write us if you have any equipment requiring such protection.

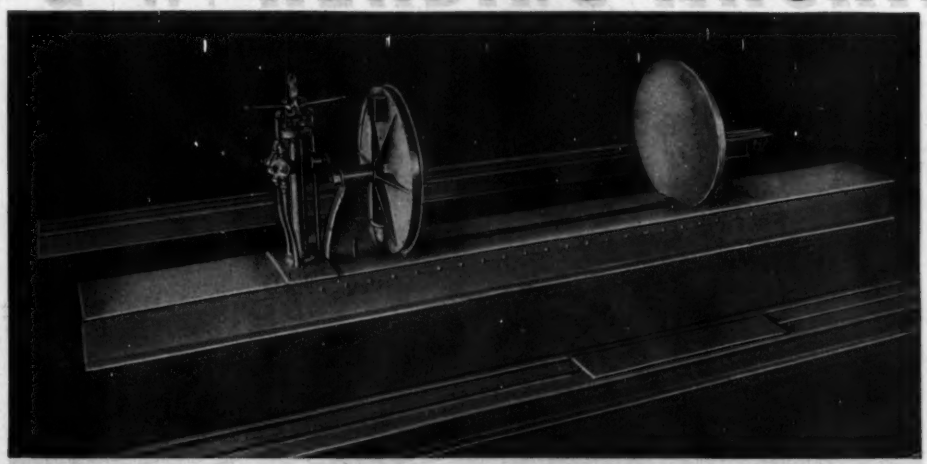
AMERICAN WRINGER CO., Inc.
Rubber Roll Specialists
Woonsocket, R. I. Farnham, Quebec

TENSILASTIC
... RUBBER ROLLS ...

FIBRE MAKING PROCESSES, INC.
435 N. Michigan Ave., Chicago

U-Bar Barking & Washing Drum
Orrmell Log Barker
Waplan Bark Press
Nekoosa Chip Cutter
F.M.P. Circ. & Ind. Heating System
Coolidge Chip Packer
F.M.P. Coarse Screen & Knotter
Blow Steam Plants
Thune Pressure Filter
Norman Chip Duster
Drammen Blow Valve
Sandberg Diffuser Valve

W. & W. HEADING MACHINE



Furnished complete ready for installation. Operated by compressed air. Heads heated by steam or electricity. Built to suit different diameters and lengths of rolls. When installed only heads and supporting stands appear above floor line. Transfer trackage and shuttle cars furnished also.

Built in association with Williams & Wilson Limited, Montreal.

Montague Machine Company
Turners Falls, Mass.

Ord. Light Prints	1.75	"	2.10
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.00	@	4.25
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	4.75
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	4.25	"	4.75
Sisal Strings	3.25	"	3.75
Mixed Strings	1.10	"	1.20

* OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
Mixed Books	1.07½	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Mixed Ledger, colored	1.87½	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.85	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	1.75	"	—
Old Corrugated Containers	1.00	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17¼	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	.26	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1	.07½	@	.07½
New White No. 2	.04½	"	.05
Light Silesias	.04½	"	.04¾
Silesias, No. 1	.04	"	.04¼
Black Silesias, soft	.03¾	"	.04
New Unbleached	.07¼	"	.07½
Washable Prints	.03¼	"	.03½
Washable No. 1	.02	"	.02¼
Blue Overall	.04½	"	.05½
Cottons—According to grades—			
Washable shredding	—	"	.01¾
Fancy Percales	.03¼	"	.03½
New Black Soft	.02¾	"	.03
New Dark Seconds	1.75	"	2.00
Khaki Cuttings—			
No. 1 O. D.	.03	"	.03¼
No. 2 Mixed	.02¼	"	.02½
Corduroy	.01¾	"	.02¼
New Canvas	.04¾	"	.05¼
New Black Mixed	—	"	.02½

Domestic Rags (Old)

White No. 1—Repacked	3.80	"	—
White No. 2—Repacked	2.90	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.50
Sisal Rope	3.75	"	—
Mixed Rope	.75	"	1.00
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Box Board Cuttings	.72½	"	—
Jute Corrugated Cuttings	.90	"	—
Overissue News	.85	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices

No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Overissue News	.85	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old Corrugated Containers	1.00	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	4.50	@	—
Sisal Rope	4.50	"	—
Mixed Rope	1.00	"	1.25
Transmission Rope—			
Foreign	(nominal)		
Domestic	4.00	"	4.25
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	5.25	"	5.50
Jute Carpet Threads	3.25	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	—	"	4.00
Scrap Sisal	4.25	"	4.50
Scrap Sisal for Shredding	4.75	"	5.00
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	4.50
Aust. Wool Pouches	5.75	"	6.00
New Burlap Cuttings	5.50	"	5.75
Heavy Baling Bagging	5.50	"	5.75
Paper Mill Bagging	3.00	"	3.25
No. 2 Bagging	1.35	"	—

* OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04¼	@	.04¾
Fancy Percales	.04¼	"	.05
New White No. 1	.08	"	.08¾
New Light Flannelettes	.06	"	.06¾
Canton Flannel, Bleached	.08¾	"	.09¼
Underwear Cutters, Bleached	.08	"	.08¾
Underwear Cutters, Unbleached	6.50	"	6.75
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03¾	"	.04
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.08¼	"	.08¾
Blue Cheviots	.04¾	"	.05
Fancy	.02¾	"	—
Washable	.01¼	"	—
Cottons According to Grades—			
Blue Overalls	—	"	.05½
New Black, Soft	.03¾	"	.04
Khaki Cuttings	.04½	"	.04¾
O. D. Khaki	.04½	"	.04¾
Corduroy	.02	"	.04
New Canvas	.06	"	.06½
B. V. D. Cuttings	.07¼	"	.08

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
* Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices.

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.50	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.17½	"	—
No. 1 Heavy Books & Magazines	1.57	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
No. 1 Roofing Rags	1.55	"	—
No. 2 Roofing Rags	1.45	"	—

Paper and Board Manufacture

International Paper Company has issued an interesting eight page folder entitled "Paper and Board Manufacture." The four page center spread in the folder, which also appeared in the Company's recently issued annual report, contains a brief illustrated story of kraft board and paper manufacture at the Company's Springhill, Louisiana, mill. Two of the machines in that plant are making container board for corrugated shipping containers, and the third machine is producing bleached kraft specialty board and papers for milk containers, milk bottle hoods, sanitary food containers, shipping tags, and file folders.

Copies of the folder may be had by addressing the Publicity Division, International Paper Company, 220 East 42nd Street, New York, N. Y.